BANK FOR INTERNATIONAL SETTLEMENTS

CROSS-BORDER SECURITIES SETTLEMENTS

Report prepared by the Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries

Basle
March 1995

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PREFACE

The present report, prepared by the Study Group on Cross-Border Securities Settlements, continues the work that was begun with the publication in 1992 of the Committee's report on *Delivery Versus Payment in Securities Settlement Systems* (the DVP Report). The DVP Report focused on the settlement of securities transactions between direct participants in a single settlement system. In the course of preparing the DVP Report, it became clear to members of the Committee that settlement arrangements for cross-border trades nearly always involve additional intermediaries whose roles and operations were not thoroughly examined in the DVP Report. In this new effort, the Study Group has examined all of the channels that market participants use to complete cross-border securities transactions, including the use of local agents, global custodians and international central securities depositories (ICSDs). Special attention has been paid to the links that have been developed between ICSDs and local CSDs.

The Study Group's work highlights several important developments in securities markets in recent years and their implications for settlement risks. The daily volume of settlements has grown dramatically over the last few years in most of the G-10 countries, in large part because of the expanding use of market transactions, such as repurchase agreements, to finance securities inventories. These same financing techniques have increased the pressure on settlement agents to permit receipt and redelivery of securities on the same day. This, in turn, has fuelled demands for the development of electronic transfer systems and efficient links between systems.

The growing importance of links between securities settlement systems has significant implications for systemic risk. Most of these systems have been designed to meet local market needs. The technology that drives them is often similar, creating an impression that all book-entry securities transfers are the same. As the present study and the DVP Report have shown, those apparent similarities can mask significant differences between systems. Participants in the securities markets must carefully examine the rules and operating procedures of each system, the governing law and the underlying custody arrangements. When carrying out settlements via links between systems, they must also carefully consider how differences in the rules and procedures of the linked systems affect settlement risks.

Many of the issues examined in this report - the role of intermediaries, custody risk and the costs and risks involved in settling "back-to-back" trades - are also important to domestic settlements. The report therefore serves two functions: it identifies sources of risk in cross-border settlement arrangements, and it contributes to a deeper understanding of risks in domestic securities settlements.

William J. McDonough, Chairman,
Committee on Payment and Settlement Systems
and President, Federal Reserve Bank of New York

March 1995

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1. EXECUTIVE SUMMARY

1.1 Background

In September 1992 the Bank for International Settlements published a report entitled *Delivery Versus Payment in Securities Settlement Systems*, which had been prepared by the Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries. That report (referred to here as the DVP Report) defined and analysed the types and sources of risk in securities settlements and clarified the meaning and implications of delivery versus payment (DVP). Building on that framework, it identified common approaches to DVP in the G-10 countries and evaluated the implications of the various approaches for central bank policy objectives concerning the stability of payment systems and financial markets and the containment of systemic risk.

In the course of preparing the DVP Report, some preliminary analysis of the risks associated with settlements of cross-border securities trades was conducted. This analysis suggested that issues arise in a cross-border context that were not addressed adequately in the DVP Report. In particular, the DVP Report focused on the settlement of trades between two direct participants in a central securities depository (CSD). However, in a cross-border trade one counterparty or both typically settle through one or more intermediaries - a local custodian bank, a global custodian or one of the international CSDs (ICSDs - Cedel and Euroclear). The involvement of such intermediaries complicates the analysis of risks in cross-border securities settlements and, if the intermediaries not only hold securities but also settle trades on their own books under rules and procedures that differ from those established by the local CSD, the risks can be fundamentally different from those faced by direct participants in the local CSD.

At a meeting in December 1992 the Committee set up a new study group and asked it to examine the implications for central bank policy objectives of the expansion of cross-border trading and the concentration of securities settlement activity in certain intermediaries. Specific objectives of the study included: (a) the development of a clearer understanding of the alternative channels through which settlements of cross-border trades can be effected; (b) an analysis of the risks associated with the use of the various channels; and (c) an assessment of whether cross-border settlement arrangements have important implications for central bank policy objectives relating to the containment of systemic risk and the oversight of payment and settlement systems.

The remainder of this section of the report summarises the results of the study group's work. Section 2 addresses certain preliminary issues, including the definition of key terms (cross-border trade, cross-border settlement) and the availability of data on the volumes of cross-border trades and cross-border settlements. Section 3 describes the alternative channels through which cross-border trades can be settled and discusses the utilisation of the various channels by different types of traders. Section 4 analyses the risks associated with the use of each of the major channels. Section 5 considers the implications of cross-border settlement arrangements for central bank policy objectives. A glossary is provided at Annex 1. Annex 2 describes the growing markets for repurchase agreements (repos) and securities loans and discusses the implications for securities settlements. Annex 3 reviews the legal issues that arise in cross-border settlements. Annexes 4 and 5 examine the "bridge" linking the Cedel and Euroclear systems and the link between Euroclear and the German CSD respectively. Annex 6 contains a bibliography.

1.2 Preliminary issues: definitions and data

In this study, a cross-border trade is defined as a trade between counterparties located in different countries. In most cases one counterparty is located in the country in which the security is issued, while the other counterparty is located in another country. A cross-border settlement is defined as a securities settlement that takes place in a country other than the country in which one trade counterparty or both are located. Again, in most cases the settlement takes place in the country of

issue of the securities, but one counterparty or both are located outside the country of issue. It is important to recognise, however, that there are frequent exceptions to these typical patterns. For example, various European government securities are traded very actively by securities dealers in London, and large volumes of trades in such securities are settled in Belgium (through Euroclear) and in Luxembourg (through Cedel).

Comprehensive data on cross-border trading or cross-border settlements simply do not exist. Where data on cross-border trading of bonds and equities are available, they indicate that the growth of such transactions has far outpaced the growth of economic activity in recent years. The best data available on cross-border settlements are those compiled by the ICSDs. However, they are far from comprehensive; for example, the ICSDs settle very few trades in equities and currently do not settle any trades in some government bonds that are heavily traded internationally. Nevertheless, these data document enormous growth in cross-border settlements of trades in certain European government securities, notably German, Dutch, French, Danish and Spanish issues. This growth has reportedly been spurred by the increasing use of sophisticated trading and financing strategies in European fixed-income markets. In particular, the ICSDs indicate that a large and growing proportion of such settlements is accounted for by the use of repos for financing and hedging positions in European government securities and related derivative instruments. The rollover of short-term repos financing longer-term positions and the dynamic adjustment of hedges have the potential to push settlement volumes even higher as such techniques come to be used more widely.

1.3 Alternative channels for effecting settlements

The study group's investigation of the channels through which settlements of cross-border trades are effected confirms that non-residents seldom participate directly in local CSDs, although local branches or subsidiaries of non-resident firms sometimes do. Instead, traditionally non-residents have normally settled their trades through a local agent (a custodian that is a direct participant in the local CSD). Local agents continue to play an important role in cross-border settlements, but today additional intermediaries are frequently involved. Many institutional investors now utilise the services of a global custodian that settles trades and safekeeps securities in many countries through a network of sub-custodians (local agents, including its own local branches). Internationally active securities dealers often settle trades through the ICSDs, which in recent years have established direct or indirect (through local agents) links to CSDs in many countries. Use of these alternative channels is not mutually exclusive; some of the most active dealers utilise both an ICSD and a local agent for settling trades in certain securities. Finally, numerous CSD-to-CSD links have been established in recent years. However, with very few exceptions, these links have not been heavily used to effect cross-border settlements.

1.4 Risks in cross-border settlements

The analysis of risks in domestic settlements that was presented in the DVP Report served as the starting-point for the study group's analysis of risks in cross-border settlements. The DVP Report identified and analysed the risks involved in domestic settlements, including principal risk, replacement cost risk and liquidity risk. The Report concluded that the largest single source of risk in securities settlements is principal risk, that is, the risk that a seller of a security could deliver but not receive payment or that a buyer could make payment but not receive delivery. A DVP mechanism was defined as a link between a securities transfer (delivery) system and a funds transfer (payment) system that eliminates principal risk. The Report identified several models for achieving DVP. However, it cautioned that no securities settlement system can eliminate replacement cost risk - the risk of the loss of an unrealised gain on an unsettled contract because of the counterparty's default. Nor can it eliminate liquidity risk - the risk that the counterparty will not settle its obligation when due, but on some unspecified date thereafter. The degree of replacement cost risk or liquidity risk in a system depends critically on the risk controls employed by the CSD. If a CSD does not

impose adequate controls, replacement cost losses or liquidity pressure arising from a default by a CSD participant could cause systemic problems.

As far as they go, the analysis and conclusions in the DVP Report are equally applicable to cross-border settlements. In fact, the only inherent differences between risks in cross-border settlements and in domestic settlements are differences in legal risks and the potential for foreign exchange settlement risks to arise in a cross-border context. By definition, cross-border settlements involve multiple legal jurisdictions, thereby raising issues relating to choice of law and conflict of laws that complicate the analysis of legal risks and can introduce new sources of risk. In addition, if money settlements in foreign currencies are funded through foreign exchange transactions, non-resident counterparties face foreign exchange settlement risks.

However, as was acknowledged in the DVP Report, the analysis it presented was limited in certain respects, and those limitations generally are far more significant in a cross-border context than in a domestic context. By far the most important limitation is that the DVP Report focused heavily on the design and operation of an individual CSD and the implications for risks to its direct participants. The Report paid relatively little attention to the effects on settlement risks of the involvement of other intermediaries. To be sure, other intermediaries, especially custodian banks, often play a role in domestic settlements, but, as already noted, in cross-border settlements the involvement of other intermediaries is pervasive.

This involvement increases the importance of several issues that were given scant attention in the DVP Report. The most basic issue is that when a non-resident (or any other party) holds its securities through an intermediary, it is exposed to custody risk, that is, the potential loss of the securities in the event that the intermediary becomes insolvent, acts negligently or commits fraud. The most important factors determining the degree of custody risk are the accounting practices and safekeeping procedures used by the intermediary. The key to protecting the non-resident's interest is often the separation (segregation) of its assets from those of the intermediary and any other parties for which it holds securities.

Another issue that increases in importance when intermediaries other than CSDs are involved is the settlement of so-called back-to-back trades and the opportunity costs and liquidity risks that arise if such trades cannot be settled efficiently. A back-to-back trade is a pair of transactions that requires a counterparty to receive and redeliver the same securities on the same day. Securities dealers frequently need to settle such back-to-back trades. In providing liquidity to markets, dealers often buy and sell the same security for the same settlement date. In addition, they often rely on repos to finance their securities inventories and reverse repos and securities loans to meet delivery obligations, including those created by short sales. As will be discussed in greater detail below, the settlement of back-to-back trades by dealers (resident or non-resident) that are not direct participants in the local CSD poses difficulties in some settlement systems. In those systems dealers are often forced to pre-position securities or borrow securities to meet delivery obligations. These requirements can add significantly to intermediation costs and, therefore, may significantly reduce secondary market liquidity. Securities that cannot be delivered out cannot be used to obtain secured financing. As a result, dealers incur higher financing costs and may also be exposed to greater liquidity risks, because unsecured financing tends to be less reliable, especially when financial markets are under stress.

A third issue that is quite important in a cross-border context but that was not addressed in the DVP Report is the risks associated with cross-system settlements, that is, settlements effected through links between securities transfer systems. These include the direct and indirect links that have been established between CSDs and ICSDs. Such cross-system settlements often involve significant inefficiencies that derive from the need for the transfer systems to exchange information on whether the two counterparties have the securities and funds (or access to credit) necessary to complete settlement. In particular, the settlement of back-to-back trades in which one or both settlements are cross-system settlements is often not possible, so that dealers are obliged to pre-position or borrow securities to complete such settlements.

Special problems can arise in cross-system settlements when one or both transfer systems are what the DVP Report termed model 3 DVP systems, that is, systems that make provisional transfers of securities that are not final until money settlement is completed later in the day (or on the following day in the case of systems that process instructions for settlement on S during the evening of S-1). In such systems, if a participant fails to cover its money settlement obligation, transfers involving that participant, including transfers of securities from that participant to participants in other settlement systems, may be unwound. At a minimum, the unwinding of such transfers would adversely affect counterparties of the defaulting participant. However, depending on how losses are borne or allocated by the system that received the provisional transfers, others among its participants that were not counterparties to the defaulting participant in the other system could also be adversely affected.

The relative importance of these issues - custody risk, back-to-back settlements and cross-system settlements - depends on the intermediary that a counterparty uses to hold its securities and settle its trades, on the services (especially credit services) that the intermediary provides to the counterparty, and on the counterparty's trading and financing strategies. In the case of a non-resident counterparty that settles its trades through one of the channels identified above, the risks associated with such cross-border settlements often differ significantly from the risks to a direct participant in the local CSD that were the focus of the DVP Report.

A local agent typically holds securities and settles trades for non-residents through an account it maintains for its customers at the local CSD. Trades involving non-residents that participate "indirectly" in the CSD through a local agent settle according to the same rules as any other trades settled by the CSD. Consequently, the settlement risks faced by a non-resident using a local agent are in many respects identical to those faced by a direct participant in the local CSD. For example, if the local CSD does not achieve DVP, the non-resident is subject to principal risk.

Nonetheless, in some other respects a non-resident settling through a local agent faces costs and risks that differ from those faced by direct participants. Quite clearly, the custody risk incurred by the non-resident is greater because it holds its securities indirectly through the local agent. In addition, a non-resident that uses a local agent may need to maintain larger balances of cash and securities than a direct participant would to settle the same set of transactions. The DVP Report emphasised that nearly all CSDs explicitly or implicitly extend substantial amounts of intraday credit to their direct participants to enable them to economise on holdings of cash balances and thereby to reduce opportunity costs and cash deposit risks (the credit risks associated with holding cash balances with an intermediary). Non-residents must look to the local agent for such intraday loans of funds. If such intraday credit is not available, a non-resident would need to hold larger cash balances than a direct participant, implying higher opportunity costs and greater cash deposit risk.

As noted earlier, the settlement of back-to-back trades by dealers that are not direct participants in the local CSD poses difficulties in some settlement systems. Specifically, in systems in which instructions to transfer securities are processed in a single batch cycle, the instruction to deliver out the security must be input prior to the processing cycle and, therefore, prior to receipt of the security. This often poses a dilemma for a local agent settling back-to-back trades through a single account for multiple customers (individual sub-accounts for customers are often not available). If the dealer fails to receive the security from its counterparty, its delivery instruction may, nonetheless, be completed using other securities in the local agent's account at the CSD.

In such systems, back-to-back trades by a non-resident dealer can be settled only if the local agent provides the dealer with what is, in effect, an intraday securities loan**.** If the local agent enters the delivery instruction and the securities are not received from the dealer's counterparty, the intraday loan becomes an overnight loan. In such circumstances, if the local agent does not own the securities itself, it would need to borrow them, either externally or internally (from another of its customers), in order to avoid a shortfall in its custodial holdings. Local agents can reduce the need for such borrowings in several ways, however. First, the likelihood of failed deliveries can be limited by prematching settlement instructions with the seller or its local agent prior to transmission to the CSD.

Second, if a local agent can attract a critical mass of securities dealers as customers, it can settle back-to-back trades between those customers on its own books. Such a local agent is effectively operating as a securities transfer system, and the costs and risks associated with settlements on its books can differ substantially from those involved in settling directly through the local CSD.

Many institutional investors use global custodians rather than local agents to settle their cross-border trades. The risks associated with settlement through a global custodian are in many respects similar to those associated with settlement through a local agent. A global custodian settles the non-resident's trades in the local market through a local agent acting as its sub-custodian. Thus, in this case, too, the non-resident's trades would typically be settled in the local CSD, effectively subject to the local CSD's rules. As in the case of use of a local agent, the non-resident faces custody risk, and the further tiering of securities holdings may exacerbate custody risk and certainly makes such risk more difficult to assess. On the other hand, by providing a single standardised gateway to multiple markets, the use of a global custodian may reduce operational risks. In addition, global custodians typically provide other services to their customers that are designed to reduce uncertainty about money settlement obligations arising from failed deliveries of securities and delayed income payments. These services (contractual settlement date accounting and contractual income collection) usually involve provisional debits and credits to customers' cash accounts that can subsequently be reversed by the custodian if the anticipated securities or funds are not received within an interval that the custodian establishes. These services reduce liquidity risks and cash deposit risks on a day-to-day basis. However, if a customer is not given prior notice of reversals of provisional credits, the objective of increasing certainty about cash flows is compromised, and the customer could face substantial liquidity risks. In addition, if a customer misunderstands the provisional nature of these credits and debits, it could underestimate its credit exposures to counterparties and securities issuers.

Use of an ICSD can change fundamentally the costs and risks associated with securities settlement. The ICSDs settle the majority of their participants' trades on their own books. Such internal settlements are effected under the ICSD's own rules and operating procedures, which often differ significantly from the rules and procedures in the local markets to which they are linked. In terms of the taxonomy developed in the DVP Report, the ICSDs are best classified as model 1 DVP systems. Because DVP is achieved, internal settlements do not involve principal risk, even if the local CSD in the country in which the securities are issued does not achieve DVP. Replacement cost risks in internal settlements currently tend to be higher because the settlement interval for trades between ICSD participants is often longer than the settlement interval in local markets, implying larger credit exposures on unsettled contracts. However, with effect from 1st June 1995, such trades will be settled on the third business day after the trade date (T+3), the same settlement interval as in many local markets.

The costs associated with settling trades on the books of the ICSDs are often lower than the costs of settling through a local agent. On the securities side, same-day turnaround of internal receipts for internal delivery is always possible, whereas, as noted above, in some local markets dealers that are not direct participants in the CSD may be required to pre-position securities for delivery or to borrow securities, adding significantly to settlement costs. On the cash side, the fact that the ICSDs run their processing cycles during the night and report cash balances early in the European business day facilitates participants' efforts to minimise holdings of cash balances.

Like local agents, the ICSDs reduce the participants' opportunity costs by extending intraday loans of funds. Because of differences in operating hours between the ICSDs and the various national payment systems, the exposures incurred by the ICSDs as a result of these credit extensions are of longer duration than the credit exposures that CSDs and local agents typically incur. These exposures are typically strictly limited and are collateralised by participants' securities holdings. Nonetheless, the exposures are substantial, and the choice of law and conflict of laws issues that arise in cross-border settlements can create ambiguities about the effectiveness of the liens involved.

ICSD participants enter into trades and financing transactions not only with other ICSD participants but also with counterparties that settle their trades in the various local markets. Settlement

of these trades with local market participants is effected using the links that the ICSDs have developed to the local markets. The costs and risks involved in such settlements are heavily influenced by practices in the local markets. For example, principal risk exists if the local CSD does not achieve DVP. In fact, the costs and risks arising in such cross-system settlements often exceed the costs and risks associated with domestic settlements in the local markets because of inefficiencies in the links between the ICSDs and the local markets. As noted earlier, the settlement of back-to-back trades across such links is often not possible. Like local agents, the ICSDs provide what are, in effect, intraday securities loans to allow such trades to settle without imposing substantial opportunity costs on their participants.

In the case of the link between the two ICSDs (the "bridge"), the inefficiencies associated with cross-system settlements (between Cedel participants and Euroclear participants) and the consequent costs and risks have largely been eliminated by the introduction in 1993 of multiple daily processing (and settlement) cycles and exchanges of information on completed settlements. To strengthen their local market links, which have become increasingly important because repo trades are quite often settled in the local market, the ICSDs have supported the introduction by local CSDs of multiple processing cycles - at a minimum, one cycle before the night-time processing cycles at the ICSDs and one cycle after. This allows ICSD participants to complete same-day turnarounds of securities, regardless of from whom they are received (the local market or an ICSD participant) or to whom they are delivered. However, as noted earlier, a serious weakness in some of these links to local markets is that the transfers from the local market that result from the evening processing cycle are not final until money settlement occurs the next day. The potential for unwinds of provisional transfers creates significant credit and liquidity interdependencies between the systems - disruptions from a settlement failure in the local market would promptly be transmitted to the ICSDs and their participants.

Even if CSD-to-CSD links are not vulnerable to unwinds of provisional transfers, such links create significant operational interdependencies between and among CSDs (and ICSDs) and can also create credit and liquidity interdependencies. An operational problem at one CSD would result in a failure to complete deliveries between their participants, which could affect the completion of deliveries at other CSDs, including CSDs not directly linked to the CSD with the operational problem. Credit and liquidity interdependencies are created when one CSD provides another CSD with a cash account and settles trades between its own participants and participants in the other CSD by debiting or crediting the other CSD's cash account. The CSD using the cash account is exposed to cash deposit risk and liquidity risk, while the CSD providing the account is exposed to credit and liquidity risks if (as often is the case) it permits overdrafts or debit balances.

1.5 Implications for central bank policy objectives

Central banks have an interest in the design and operation of securities settlement systems because of their implications for central bank policy objectives relating to financial stability and the containment of systemic risk and to the effectiveness of central bank oversight of payment and settlement systems. Central banks have broad responsibilities for the stability of the financial system as a whole. In particular, as lenders of last resort, they are usually at the centre of efforts to contain threats to financial stability. These responsibilities require central banks to identify sources of systemic risk and to consider how such risk can be diminished. The failure of a large trader or settlement intermediary to meet its obligations could produce liquidity pressures or credit losses on a scale sufficient to threaten the stability of the financial system as a whole. In particular, a disturbance in a securities settlement system could spill over to money markets or to payment systems. Indeed, the potential for such spillovers is likely to have increased in recent years because of the increased importance of repos as money market instruments, the increased use of securities collateral to control risks in payment systems, and the rapid growth of securities settlement volumes.

Central banks are especially concerned about disturbances to payment and securities settlement systems and to money markets because such systems and markets are relied upon as vehicles for the execution and transmission of monetary policy. Because of these concerns, central banks oversee developments in their domestic money markets and payment systems. In the case of settlement systems for government securities, most of the G-10 central banks actually operate the home country CSD as part of their role as fiscal agent for the Government. Some of the G-10 central banks also play a role in the oversight of privately operated securities settlement systems, although in other cases such oversight is the responsibility of securities supervisors or is shared by central banks and securities supervisors.

Systemic risks in domestic securities settlements were analysed in the DVP Report. However, as already noted, the DVP Report focused heavily on the management by individual CSDs of their credit and liquidity exposures to their direct participants. In particular, the Report emphasised that nearly all CSDs extend substantial amounts of intraday or overnight credit to their participants and that the degree of systemic risk in a securities settlement system depends critically on the risk controls that a CSD imposes to limit potential losses and liquidity pressures in the event that participants fail to repay such credit extensions. The DVP Report paid relatively little attention to other intermediaries involved in the settlement process, including those that hold securities for counterparties that are not direct participants in the CSD and, in some cases, settle trades between such counterparties on their own books. In cases in which settlement activity and settlement risks tend to be concentrated in these other intermediaries, this is a significant shortcoming. A failure by such an intermediary to meet its obligations could be a significant source of systemic risk, even if the CSD that operates the core settlement system continues to meet its obligations to its direct participants.

The study group has concluded that the most important implication of the expansion of cross-border settlement activity for central bank policy objectives relating to the containment of systemic risk is that a central bank should be concerned not only about how the home country CSD manages its risks, but also about how the other intermediaries that play a central role in cross-border settlements of trades in home country securities manage their risks and about how the effects of financial or operational problems at such intermediaries would be contained. To a greater degree than is typically the case in domestic settlements, risks in cross-border settlements are concentrated in such intermediaries, especially in the ICSDs and in local agents that settle trades for international securities dealers. Furthermore, differences between the operating hours of the ICSDs and the operating hours and settlement practices (especially finality rules) of national payment systems and local CSDs require the ICSDs to make credit extensions to their participants that are of unusually large size and long duration, in order to reduce the opportunity costs of maintaining cash and securities balances to meet settlement obligations. Finally, the links that have been developed to effect cross-system settlements between the two ICSDs and between the ICSDs and local markets create significant operational interdependencies among settlement systems and can also create significant credit and liquidity interdependencies. As noted earlier, the possibility in some links that provisional transfers of securities between systems may subsequently be unwound is a particularly disturbing example of such interdependencies.

Should a disturbance to a cross-border settlement arrangement occur, central banks and other authorities could face special difficulties in containing it. In the first place, the authorities in the home country might not become aware of the problem promptly, especially if the disturbance originated with a counterparty or intermediary located outside the home country. Once a problem became apparent, its resolution would be likely to require coordination among several authorities in the home country and probably in other jurisdictions as well. Their efforts could be complicated by choice of law and conflict of laws problems that would create uncertainty about the finality of securities transfers, ownership rights or rights to collateral. Limited access by non-resident counterparties or intermediaries to liquidity in the home country currency could also complicate crisis management.

The critical role in cross-border settlement arrangements played by intermediaries other than the local CSD poses challenges to central bank oversight of domestic interbank markets and

payment and settlement systems. The most basic challenge stems from the lack of transparency in cross-border settlement arrangements, which, as just noted, could handicap the central bank in responding to disturbances. When the critical intermediaries are located outside the home country, additional challenges arise. In such circumstances, the financial and operational problems of the non-resident intermediaries are a potential source of systemic disturbances to home country money markets and payment and settlement systems, but the central bank and other home country authorities may have only limited influence over those intermediaries' design and operation. Finally, as already noted, containment of the consequences of a serious financial or operational problem at a foreign intermediary would require a high degree of cooperation and coordination among central banks and other relevant authorities in multiple jurisdictions.

2. PRELIMINARY ISSUES

2.1 Scope of the study: key definitions

In this study, a cross-border trade is defined as a trade between counterparties located in different countries. A cross-border settlement is defined as a securities settlement that takes place in a country other than the country in which one or both counterparties are located. Under these definitions every cross-border trade results in a cross-border settlement, but cross-border settlements can also result from domestic trades.

In the simplest and most common case, a counterparty located outside the country in which the security is issued trades with a counterparty located in the country of issue, and the trade is settled in the country of issue. However, it may be noted that the country of issue of a security is not necessarily the country in which the security is most actively traded or the country in which the majority of trades are settled. In the case of Euro-bonds, issuers are located in a variety of countries, the most active trading is usually in London, and settlement usually occurs in Belgium (through Euroclear) or in Luxembourg (through Cedel). In the last few years, much the same pattern has emerged for certain European government securities - much of the trading reportedly takes place in London rather than in the country of issue, and trades are often settled on the books of Cedel or Euroclear or via a link between one of these systems and a settlement system in the country of issue. For trades settled over these links, settlement should probably be considered to take place in more than one country. In any event, however, such settlements clearly should fall within the definition of the term cross-border settlement and, therefore, within the scope of this study.

It is worth noting that under the above definitions trading and settlement of a security outside the country of issue would not be considered cross-border trading or cross-border settlement if the counterparties are located in the same country and settlement takes place in that country. For example, secondary trades and related settlements of depository receipts would not be considered cross-border trades or cross-border settlements.[1] In such cases, however, a bank or CSD in the home country must hold the securities in custody for a bank or CSD in the country in which the trading and settlement take place, so that a cross-border custody relationship is involved.

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1 A depository receipt is an instrument that is issued in one country to establish entitlement to a security held in custody in another country. Depository receipts are then traded and settled in the domestic market in place of the foreign securities that they represent.

2.2 Expansion of cross-border trading and cross-border settlements

Comprehensive data on cross-border trading or cross-border settlements simply do not exist. The best data on cross-border trading are compiled from national balance-of-payments statistics. As shown in Table 1, these data indicate that in the G-7 countries the growth of cross-border trading of bonds and equities has far exceeded the growth of GDP over the last two decades and especially during the last few years. It should be noted that the quality of these data varies. The primary purpose of balance-of-payments statistics is to measure changes in net holdings of foreign securities by domestic residents and of domestic securities by foreign residents rather than gross volumes of cross-border trading. Indeed, the United Kingdom, which is probably the most important centre for cross-border trading, discontinued collection of gross transactions data after 1991. Nevertheless, that cross-border trading has grown extremely rapidly in recent years cannot be seriously disputed.

Table 1

Cross-border trading of bonds and equities[1]

(as a percentage of GDP)

Country	1970	1975	1980	1985	1990	1993
United States	2.8	4.2	9.3	36.4	92.1	134.9
Japan	n.a.	1.5	7.0	62.8	120.7	78.7
Germany	3.3	5.1	7.5	33.9	61.1	169.6
France	n.a.	n.a.	8.4[2]	21.4	53.6	196.0
Italy	n.a.	0.9	1.1	4.0	26.6	274.6
United Kingdom	n.a.	n.a.	n.a.	366.1	689.0	1,015.8[3]
Canada	5.7	3.3	9.6	26.7	64.1	152.7

Note: n.a. = not available. [1] Gross purchases and sales of securities between residents and non-residents. [2] 1982. [3] 1991. The series has since been discontinued.

Source: National balance-of-payments statistics.

As will be discussed in greater detail, cross-border settlements can be effected through multiple channels and usually involve multiple intermediaries. In part for this reason, data collected by local CSDs generally do not permit cross-border settlements to be isolated. By far the best data on cross-border settlements are collected by the ICSDs (Cedel and Euroclear).[2] However, these data are far from comprehensive. Because they have not been able to establish the requisite links to the local settlement systems, the ICSDs do not currently settle trades in US or Japanese government bonds or UK gilts, all of which are heavily traded and settled cross-border. Furthermore, although the ICSDs settle trades in a wide range of internationally traded equities, their share of total cross-border settlements of such instruments is negligible. It should also be noted that the ICSD data include both settlements of outright purchases and sales of securities and settlements of collateral transactions (repos and securities loans). Although precise figures are not available, the ICSDs estimate that repos are the fastest growing component of settlement activity and have already reached around 30% of total activity. Annex 2 describes repos and other collateral transactions and presents available information on the relative significance of various types of collateral transactions in the G-10 countries.

Even with these limitations, the ICSD data are quite informative. They clearly document that cross-border settlements have been growing very rapidly and have reached levels that are quite large relative to total settlement volumes in most national settlement systems. Chart 1 shows that

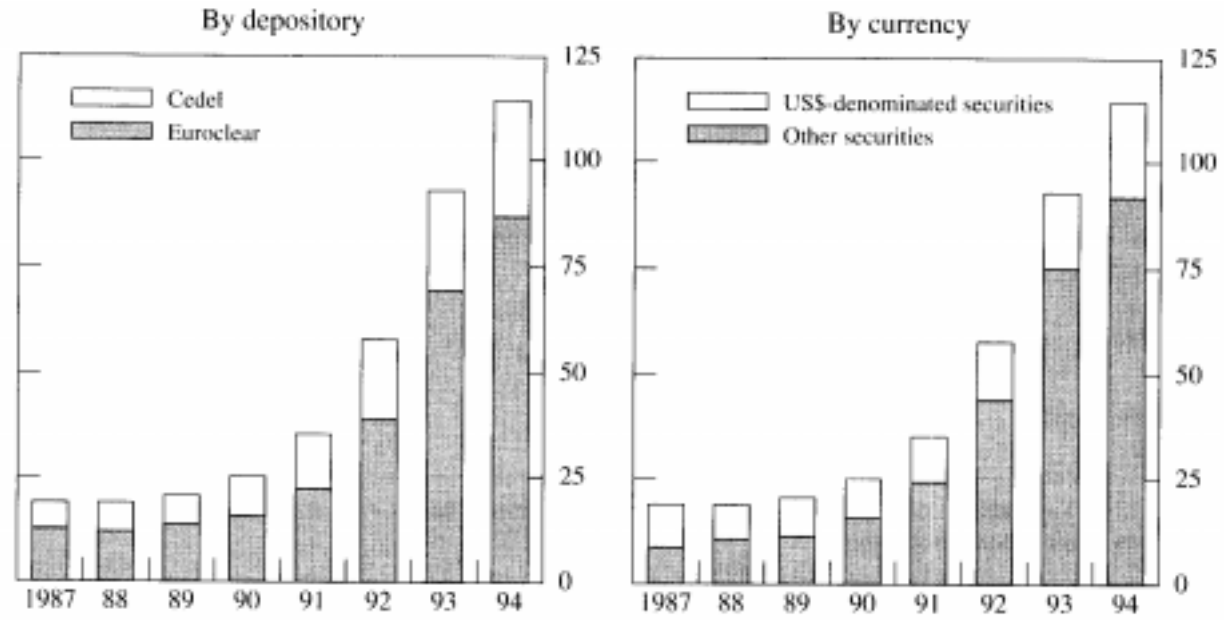
[2] Settlement volumes reported by the ICSDs include some settlements that, under the definitions used in this study, are domestic settlements - that is, settlements of trades between Belgian residents in Euroclear and between Luxembourg residents in Cedel. However, such settlements constitute a very small share of total ICSD volumes.

average daily settlement volumes at the ICSDs reached the equivalent of US$ 112 billion in 1994 and have been growing over the last few years at a compound annual rate of around 50%. The left-hand panel shows that Euroclear has accounted for about three-quarters of the total during the last two years, compared with about a two-thirds share in earlier years. More dramatic changes have occurred in the currency composition of settlement volumes. As shown in the right-hand panel, in 1987 settlements of US dollar-denominated securities accounted for about 55% of the total volume, but that share has been shrinking steadily and fell to less than 20% in 1993 and 1994.

Chart 1

International central securities depositories

(average daily settlement volumes, in billions of US dollars*)



* Includes internal deliveries within each system, deliveries received by each system from the other (via the bridge) and deliveries to and from each system via links to domestic systems.

Sources: Cedel and Euroclear.

Table 2 provides additional information on the types of instruments settled by the ICSDs. The ICSDs were created about twenty-five years ago to settle trades in Euro-bonds. However, as can be seen, settlements of Euro-bonds now account for a small fraction of their overall settlement activity. The bulk of the activity is now in other fixed-income bonds, predominantly European government securities. Deutsche Mark issues are by far the largest single category, but significant volumes of securities denominated in Dutch guilders, French francs, Danish kroner and Spanish pesetas are also settled. US dollar-denominated securities are the second most actively settled, but the instruments involved are largely Euro-bonds and money market instruments. As noted earlier, the ICSDs currently do not have links to the local CSD (Fedwire) that would permit them to settle trades in US government securities.

Table 2

ICSD turnover by currency[1]

(daily averages in US$ bn equivalent, 1994)

Currency	All instruments	Fixed-income bonds		Other instruments[2]
		Euro-bonds	Other	
1. Deutsche Mark	44.8	0.6	43.0	1.2
2. US dollar	22.1	8.0	0.8	13.3
3. French franc	7.8	1.3	4.8	1.7
4. Dutch guilder	7.0	0.2	6.7	0.1
5. ECU	7.0	1.9	2.6	2.5
6. Danish krone	5.1	.[1]	5.1	.[1]
7. Spanish peseta	3.1	.[1]	2.8	0.2
8. Japanese yen	4.2	2.6	0.2	1.4
9. Pound sterling	2.3	1.4	.[1]	0.9
10. Italian lira	2.2	0.7	1.0	0.5
Memorandum item:				
All currencies	111.8	18.1	70.5	23.2

[1] Less than $50 million. [2] Lines 1 to 10 exclude $1.3 billion in turnover in warrants and equities at Euroclear, because the currency breakdown is unavailable. [3] Short and medium-term notes, floating rate notes, CDs and convertible bonds.

Sources: Cedel and Euroclear.

Table 3 shows that the volumes settled by the ICSDs are exceeded by only a few national settlement systems, and volumes at most of the national systems have not been growing as rapidly as at the ICSDs. Furthermore, in at least two cases (Germany and the Netherlands) the volumes of government bonds and other domestic securities settled in the ICSDs are comparable to the total volumes of securities settled in the national settlement systems (DKV and SCC respectively).[3] Taken together, these data underscore the importance of cross-border trading and cross-border settlements in certain government bond markets and the importance of the ICSDs as a channel for effecting such cross-border settlements.

3. ALTERNATIVE CHANNELS FOR SETTLING CROSS-BORDER TRADES

3.1 Overview

Chart 2 illustrates the alternative channels through which a non-resident of the country of issue of a security could (in principle, if not in practice) effect a cross-border settlement of a trade in the security.[4] As indicated by the boxes at the bottom of the chart, a non-resident could settle its trades through any of as many as five different channels: (1) through direct access to (membership in) the CSD in the country of issue; (2) through a local agent (a local bank that is a member of the CSD in the country of issue); (3) through a global custodian that employs a local agent as sub-custodian;

[3] Although precise data are not yet available for the Netherlands, this statement is believed to be accurate.

[4] The term non-resident is used throughout this report to refer to a party that is located outside the country in which described events are taking place or other parties to a described transaction are located. It is not intended to have any other significance.

(4) through an ICSD that has established a direct or indirect (through a local agent) link to the CSD in the country of issue; or (5) through a CSD in the non-resident's own country that has established a link (usually direct) to the CSD in the country of issue.

Table 3

Settlement volumes in selected securities settlement systems[1]

(daily averages[2])

System	Location	Types of securities	Settlement volume	
			US$ billions 1994	Growth rate (%) 1988-94
1. Fedwire	United States	Government	578.8	7.9
2. JGB	Japan	Government	132.1	7.6[3]
3. CGO	United Kingdom	Government	93.6	51.3[4]
4. Euroclear	ICSD	Govt.; equities; other	84.7	40.5
5. DTC/SDFS	United States	Other[5]	81.2	116.0[6]
6. CDS/BBS	Canada	Govt.; equities; other	60.0[7]	n.a.
7. DTC/NDFS	United States	Equities; other	52.8	8.9
8. RELIT	France	Govt.; equities; other	37.4	19.5[8]
9. LDT	Italy	Govt.; equities; other	31.1	74.6
10. Cedel	ICSD	Govt.; equities; other	27.1	26.8
11. VPC	Sweden	Govt.; equities; other	24.4	n.a.[9]
12. DKV	Germany	Govt.; equities; other	23.5	27.7
13. Saturne	France	Government; other	22.0	67.0
14. CMO	United Kingdom	Other	15.6	15.4[4]
15. NBB	Belgium	Government; other	8.0	53.1[4]
16. SEGA	Switzerland	Govt.; equities; other	2.2	15.3
17. SCC	Netherlands	Govt.; equities; other	n.a.	n.a.

Note: Further information on most of these systems is provided in Annex 3 of the DVP Report; n.a. = not available.

[1] The data on settlement volumes in the different systems are not strictly comparable. For example, in a few systems the sale and repurchase of a security under a repurchase agreement requires only a single transfer instruction and is recorded as one settlement, while in most systems it requires two transfer instructions and is recorded as two settlements. [2] In most cases, daily averages were computed by dividing annual turnover figures by 250. [3] Represents the combined growth rate of JGB settlements in the JGB book-entry and registration systems; in the period 1988-94, settlements in the JGB BE system grew by 23%, while settlements in the JGB registration system declined by 4%. [4] For 1991-94 only. [5] Primarily commercial paper, but also other instruments settling in same-day funds. [6] Very rapid growth reflects the phase-in of commercial paper issues into the same-day funds system. [7] October 1993 to October 1994. [8] For 1992-94 only. [9] The system was implemented progressively during the second half of 1993.

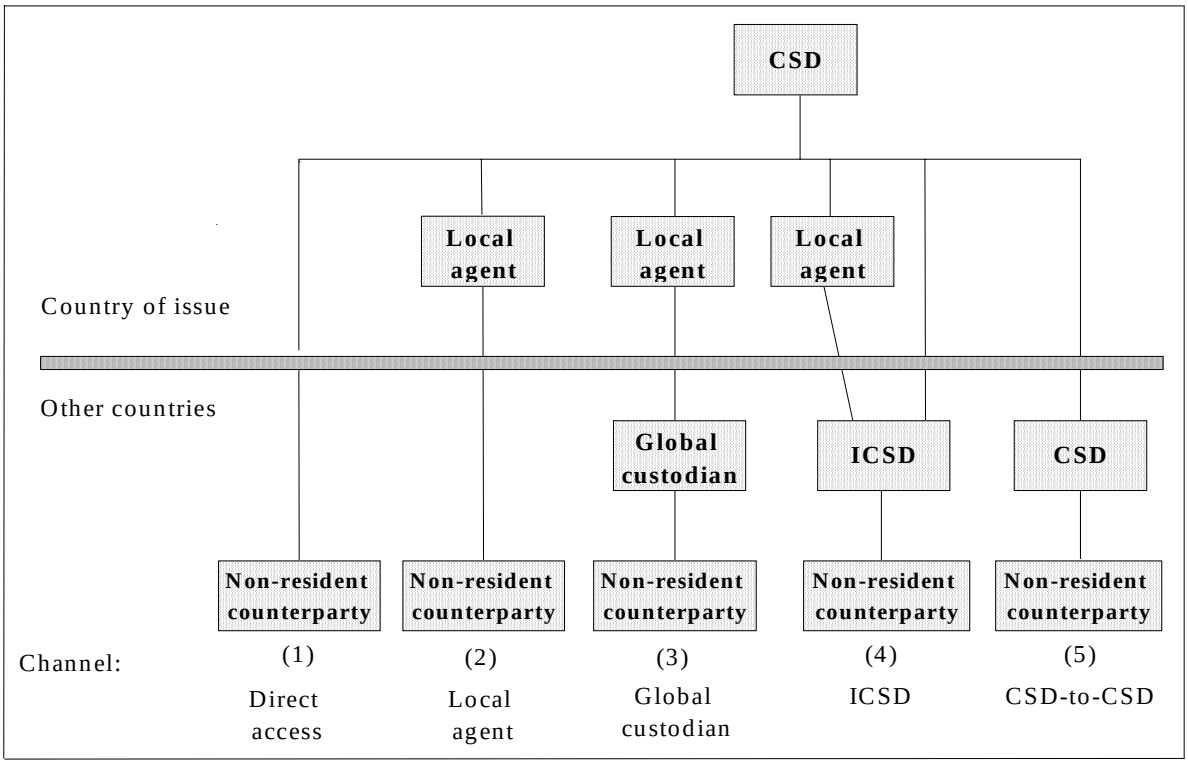
Discussions with industry participants, as well as the results of a February 1991 survey by the International Stock Exchange and Price Waterhouse, confirm that direct access is very seldom possible and, in any event, probably would not be attractive to non-residents.[5] Nor, with a few exceptions, are CSD-to-CSD links heavily utilised. Historically, local agents have been used most frequently, and the use of local agents probably remains the most common method of cross-border settlement. In recent years, however, institutional investors have increasingly used global custodians, while securities dealers (both commercial banks and broker-dealers) have increasingly turned to the ICSDs to settle trades in European government securities. As illustrated in Chart 3, use of the different channels is not necessarily mutually exclusive. Some of the most active securities dealers

[5] See International Stock Exchange and Price Waterhouse (1991). The focus of this study was on settlements of cross-border trades in equities.

currently utilise both an ICSD and a local agent for settling trades in certain European government securities; trades with other ICSD participants are settled through the ICSDs, while trades with local market participants (often repos) are settled through a local agent.

Chart 2

Alternative channels for settling cross-border securities trades

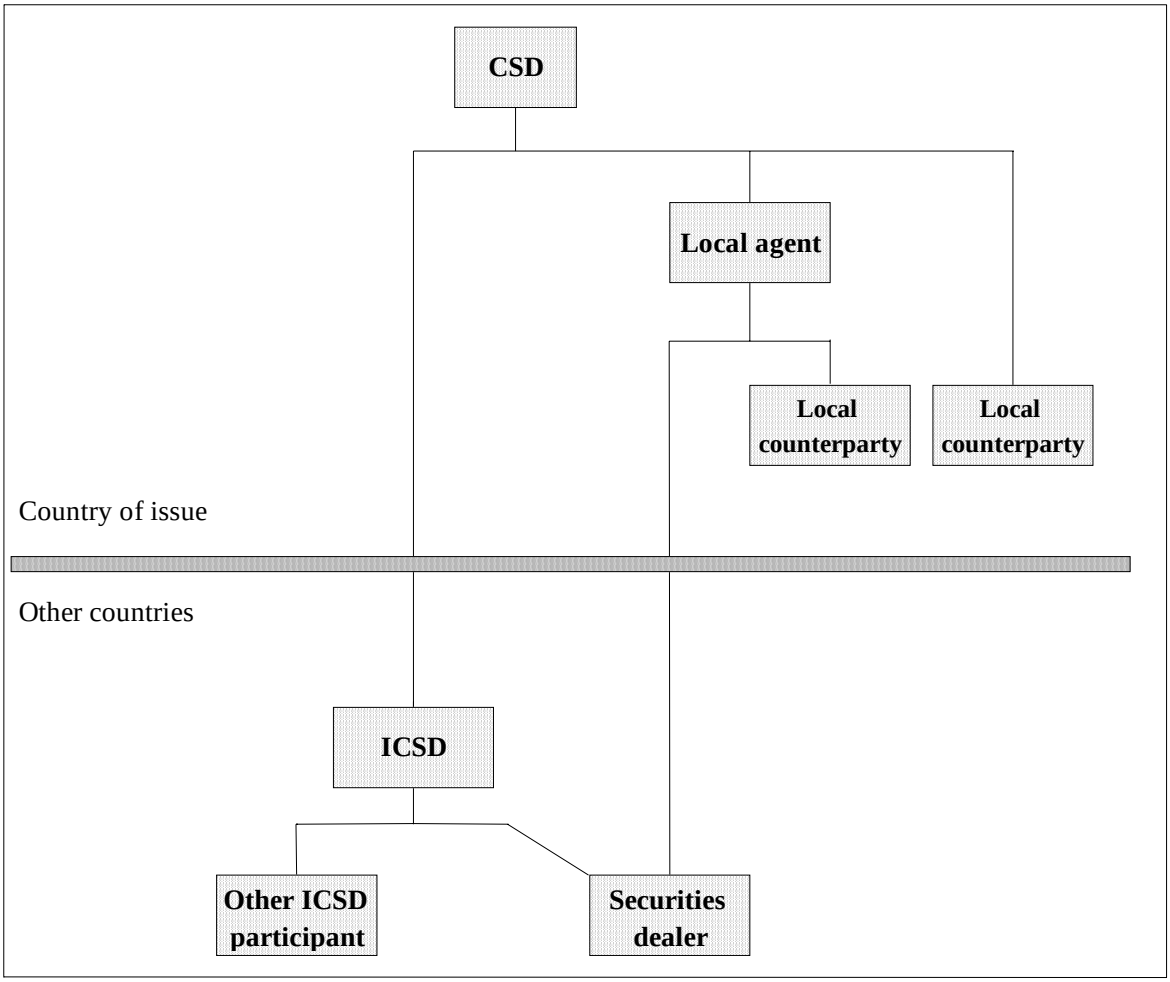


In choosing a settlement service provider, both of the aforementioned groups of traders - institutional investors and securities dealers - evaluate the quality and cost of custody services and of cash management services. But securities dealers place special emphasis on a settlement service provider's ability to settle back-to-back trades, that is, to receive and redeliver the same securities on the same day. This requirement arises from their trading and financing patterns. In making markets, dealers often buy and sell the same security for the same value date. Furthermore, dealers often finance long and short positions associated with market-making, positioning and hedging of securities and related derivative products through repos and reverse repos respectively.[6] Dealers typically seek to settle the repos and reverse repos on the same date on which the related cash positions settle. In addition, repos tend to be short-maturity transactions that are rolled over frequently, and each rollover entails a back-to-back settlement. By contrast, institutional investors historically have not placed heavy emphasis on back-to-back settlements because they tend to buy and hold securities rather than actively trade them. However, back-to-back settlements are becoming increasingly important to those institutional investors that actively lend securities from their portfolios.

6 The use of repos, reverse repos and securities loans by securities dealers, including their role in derivatives activities, was discussed in detail in a recent study published by the International Securities Market Association. See International Securities Market Association (1994).

Chart 3

Use of both an ICSD and a local agent



3.2 Direct access

CSDs typically prohibit foreign residents from becoming participants. The principal exception to this generalisation is that foreign CSDs and the ICSDs in many (but by no means all) cases have been allowed to establish direct links to local CSDs.[7] Even if direct access were allowed, foreign residents would probably find it unattractive. Local banking arrangements would still be necessary. More important, certain settlement and post-settlement functions, such as matching of settlement instructions or processing of corporate actions, would in many cases be quite difficult to perform effectively without a local presence. Local branches or subsidiaries of non-resident firms are allowed to participate in local CSDs, and that option is sometimes utilised.

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[7] In the European Union, prohibitions on access by foreign residents in other EU countries may not survive for long because they appear fundamentally inconsistent with the "single passport" concept embodied in the banking and investment services directives.

3.3 Use of a local agent

As noted at the beginning of this section, the use of a local agent (a custodian) in the country of issue remains perhaps the most common method of settling cross-border trades. Local agents typically offer both residents and non-residents the full range of settlement, banking and custody services necessary to settle trades and service securities holdings.[8] With regard to settlement, an important service provided by local agents in many markets is the prematching of settlement instructions prior to transmission to the CSD, which is usually performed via telephone or telefax rather than through an automated system. Banking services typically include cash management (funds transfer, overdraft facilities, investment of excess balances), foreign exchange transactions and, in many markets, securities lending and borrowing. Custody services include securities safekeeping, collection of interest and dividends and processing of corporate actions (including actions requiring responses by securities owners - options, rights offerings and debt reorganisation plans). Important elements of all of these services are the communications link between the local agent and its customers, the format in which the agent requires its customers to input instructions, and the content and format of reports that the agent distributes to its customers. Ease of communications and the quality, timeliness and accuracy of reports are critical determinants of the choice of an agent.

As will be discussed in greater detail in Section 4 and in Annex 3, the range of services and the terms on which they are provided are a matter of negotiation and contract between the local agent and its customers. At this point it is worth noting that while the services described in the previous paragraph are commonly offered to customers by local agents, local agents in some markets reportedly also settle trades between their customers internally, that is, through entries on their own books rather than on the books of a CSD. A local agent can offer such services only if it attracts a critical mass of customers, so that a significant volume of trades involve its customers as both seller and buyer of the securities. A critical mass is achievable in many markets because markets for custody and settlement services tend to be highly concentrated. In fact, the network economies associated with internal settlements may be a significant reason for the concentration of settlement activity in a few local agents.

3.4 Use of a global custodian

As noted earlier, institutional investors increasingly are using a global custodian to settle trades in a wide variety of countries. A global custodian provides its customers with access to settlement and custody services in multiple markets through a single gateway by integrating services performed by a network of sub-custodians, including the global custodian's own local branches and other local agents. The primary advantage to institutional investors of using a global custodian rather than a network of local custodians appears to be lower costs made possible by the global custodian's realisation of economies of scale and scope. The provision of custody and settlement services requires significant investments in information technology, communications systems and local agent networks. A global custodian, through economies of scale and scope, is able to spread its fixed costs over more transactions and to offer a variety of reporting, information, accounting and credit services to the investor at lower cost than if these services were purchased separately from a variety of service providers and local agents. By using a global custodian, an investor also avoids the burdens imposed by the need to maintain multiple communication links, conform to multiple formats for inputting settlement instructions, and receive and interpret reports from local agents in each local market in which it trades.

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[8] The services provided by custodians are described and analysed in considerable detail in a series of reports published by the International Society of Securities Administrators in 1992. See International Society of Securities Administrators (1992a, 1992b, 1992c, 1992d).

Another important advantage to institutional investors deriving from the use of global custodians is the availability of integrated multi-currency banking and cash management services. As will be discussed in the next section, some global custodians eliminate the need for their customers to manage liquidity demands in multiple currencies by providing services that allow daily conversion of all foreign currency denominated receipts and payments into the investor's home currency.

3.5 Use of an international central securities depository (ICSD)

The ICSDs - Euroclear and Cedel - were originally set up to provide settlement and custody services for Euro-bonds. Euroclear was founded in 1968 by the Brussels office of Morgan Guaranty Trust Company of New York (MGT). However, since then its organisational structure has changed in several ways, and it currently has a rather complex structure. The Euroclear system is owned by a UK company, the Euroclear Clearance System Public Limited Company, which, in turn, is owned by more than one hundred of its participants. Policies for the Euroclear system (including admission, pricing and rebates) are set by the board of directors of a Belgian cooperative, the Euroclear Clearance System Société Coopérative, which is owned by the UK company and system participants. However, MGT continues to operate the system (through its Euroclear Operations Centre (EOC)) under the terms of a contract with the cooperative, and MGT maintains all securities and cash accounts for participants, provides banking services (e.g. funds and securities loans and foreign exchange transactions) and bears and manages the risks associated with providing those banking services. Admission to membership is for the most part limited to banks, broker-dealers and their affiliates.[9]

The Centrale de Livraison de Valeurs Mobilières (Cedel) was incorporated in 1970 as a limited company under Luxembourg law. Cedel is owned by more than one hundred financial institutions (banks and brokers). It is currently registered in Luxembourg as a bank. Participants hold their cash and securities accounts with Cedel. Cedel provides some banking services (e.g. intraday credit) but other services (e.g. securities lending) are provided by banking syndicates, which bear the risks of participants' financial difficulties. Participation is generally limited to banks, broker-dealers and their affiliates.[10]

In the last few years, the role of the ICSDs in securities settlements has been transformed as they have developed links to dozens of local CSDs, and securities dealers (banks and broker-dealers) have made heavy use of some of these links, especially those to settlement systems for European government securities. According to these securities dealers, use of the ICSDs offers several advantages. Much like global custodians, ICSDs offer access to multiple markets through a single gateway at costs that reflect the realisation of economies of scale and scope. In addition, the ICSDs have the critical mass of participants that allows them to settle a very large share of their participants' trades internally (on the books of one ICSD or the other) or over the "bridge" that links the two systems. The fees charged by the ICSDs for an internal settlement or a settlement via the bridge are often much lower than the settlement fee charged by a local agent. Finally, the ICSDs are designed and operated in ways that facilitate effective management of both cash and securities positions by securities dealers. On the cash side, by scheduling settlement cycles during the night, the ICSDs are able to provide participants with reports on their balances very early in the European business day. For most currencies, this allows ample time to cover any funds overdrafts or to invest excess balances, thereby allowing dealers to economise on their holdings of cash balances and to limit the associated opportunity costs. On the securities side, through internal settlements and intraday securities loans, settlement of back-to-back trades is quite often possible, even in local markets in which the settlement

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[9] Euroclear recently eased its admission standards to allow institutional investors to become limited participants for the sole purpose of settling repurchase agreement transactions on Euroclear's books.

[10] Like Euroclear, Cedel has recently admitted institutional investors solely for the purpose of settling repurchase agreements on Cedel's books.

of such trades through local agents is difficult or impossible. Consequently, the opportunity costs associated with the need to pre-position or accept delayed availability of securities are limited.[11]

3.6 Use of a bilateral link between central securities depositories (CSDs)

Numerous CSD-to-CSD links have been established.[12] However, data collected by the study group indicate that these links are very seldom heavily utilised. In many cases such links are designed primarily to facilitate domestic trading and settlement of foreign securities by members of the same CSD, rather than cross-border trading and cross-border settlements between members of different CSDs.[13] Where cross-border settlements are possible, use of this channel has reportedly been limited for several reasons. First, the links can often be used only to settle trades in securities that are listed on stock exchanges in both countries rather than in the full range of securities traded in the linked markets. Second, the banking and cash management services provided are often not competitive with those offered by alternative settlement service providers. Finally, the links often do not provide the full range of custody services that are needed. Even if those limitations were overcome, some market participants question the fundamental economics of many CSD-to-CSD links, arguing that the upfront costs of establishing a link (including costs of developing information processing and communications systems and costs of legal analyses) are so high that the costs outweigh the benefits unless the value of securities held through the link is exceptionally large.[14]

4. RISKS IN CROSS-BORDER SETTLEMENTS

4.1 Background and overview

The analysis of risks in domestic settlements that was presented in the DVP Report served as the starting-point for the study group's analysis of risks in cross-border settlements. The DVP Report defined and analysed the types and sources of risk in securities settlements and clarified the meaning and implications of DVP. The Report concluded that the largest single source of risk in securities settlements and the key concept for understanding the meaning and implications of DVP is principal risk. This is the risk that the seller of a security could deliver but not receive payment or that the buyer could make payment but not receive delivery, which could entail a loss equal to the full principal value of the securities involved. A DVP mechanism is a link between a funds transfer (payment) system and a securities transfer (delivery) system that eliminates principal risk.

Because principal risk is the single largest source of risk in the settlement process, the Report concluded that the achievement of DVP is critical. However, even if DVP is achieved, the Report cautioned, other risks exist that may be potential sources of systemic problems. For example, no securities settlement system eliminates replacement cost risk, that is, the risk of the loss of an

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11 As will be discussed below, however, settlement of back-to-back trades in which one of the trades is with a local market participant rather than an ICSD participant can be even more costly and difficult than in the local market in cases in which the link to the local market is inefficient.

12 Annex 5 describes the linkages that one CSD, the Deutscher Kassenverein AG (DKV), has established with foreign CSDs, either directly or through the Auslandskassenverein (AKV).

13 Often the links do not permit a member of one CSD to deliver a security against payment to a member of the other CSD. Instead, only free-of-payment transfers are permitted.

14 The fees charged for holding securities directly with a CSD are usually lower than the fees charged by a local custodian, global custodian or ICSD. The value of the savings from the lower fees would tend to increase with the value of securities held, potentially offsetting the fixed costs if the volume of securities held is sufficiently large.

unrealised gain on an unsettled trade because of default by the counterparty prior to settlement. This risk can be reduced by compressing the settlement interval, that is, the amount of time between the execution of a trade and its settlement, but it could be eliminated only by settling trades in real time as they are executed, a practical impossibility given current technology and institutional arrangements.

Even more important from a systemic risk standpoint, DVP does not eliminate liquidity risk, that is, the risk that a counterparty will not settle an obligation when due, but on some unspecified date thereafter. Settlement systems do not eliminate fails. They often provide for the lending of funds or securities to participants to facilitate settlements and reduce liquidity risks, but the amount of credit available is typically limited. While liquidity problems from failures to settle occur day in and day out and are ordinarily quite manageable, they have the potential to create systemic problems if they occur in an unsettled financial environment, for example following a market break or during a recessionary period. In such an environment, failures to settle when due may undermine confidence in the creditworthiness of counterparties, inducing some participants to withhold deliveries or payments and, in turn, preventing others from meeting their obligations.

Finally, DVP cannot eliminate cash deposit risk, that is, the credit risk associated with the holding of cash balances with an intermediary for the purpose of settling securities transactions. This risk can be eliminated by the use of central bank money for payments, but in many countries non-residents and domestic non-bank participants in the securities markets do not have access to central bank funds accounts. Consequently, some or all participants in a settlement system must make payments through funds accounts at commercial banks and cannot avoid cash deposit risks. Nonetheless, cash deposit risks can be substantially mitigated if the money balances used to make payments are same-day funds, that is, if the funds can be transferred or withdrawn on the day of receipt.

With respect to ways of achieving DVP (or, perhaps more accurately, of linking a funds transfer system to a securities transfer system (a CSD)), the Report's review of arrangements in the G-10 countries revealed a wide variety of approaches. Although not all of these arrangements could be fitted neatly into any simple taxonomy, the Report distinguished three broad structural approaches:

Model 1: systems that settle transfer instructions for both securities and funds on a trade-by-trade (gross) basis, with final (unconditional) transfer of securities from the seller to the buyer (delivery) occurring at the same time as final transfer of funds from the buyer to the seller (payment);

Model 2: systems that settle securities transfer instructions on a gross basis, with final transfer of securities from the seller to the buyer (delivery) occurring throughout the processing cycle, but settle funds transfer instructions on a net basis, with final transfer of funds from the buyer to the seller (payment) occurring at the end of the processing cycle;

Model 3: systems that settle transfer instructions for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.[15]

While this taxonomy is useful in identifying sources of risk in different types of systems, the Report concluded that the degree of protection against systemic risk that a system actually provides depends more on the specific risk management safeguards in place than on which model is employed. The key to understanding this conclusion is to recognise that nearly all settlement systems extend credit to their participants in order to minimise the opportunity costs of holding cash balances for the purpose of settling securities transactions. In model 1 systems, such credit extensions are explicit, taking the form of daylight overdrafts in systems that operate in real time or the acceptance of pre-advices or provision of overdraft facilities in systems that process instructions in one or more batches. In model 2 or model 3 systems, the credit extensions are implicit in the decision to allow funds transfer instructions to be settled on a net basis.

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[15] In many cases, there are in fact several processing cycles, but none of the transfers of funds and securities is final until some time after completion of the last processing cycle.

Consequently, the Report concluded that, regardless of the structural approach taken to achieving DVP, the key issue to be addressed in assessing a system's implications for systemic risk is how well it could cope with the failure of one or more participants (or their guarantors, if any) to repay such credit extensions. The strength of a system depends critically on the safeguards employed by the system operator to limit potential losses and liquidity pressures from such a failure. The Report's review of systems in the G-10 countries revealed that the safeguards employed varied considerably from system to system. All of the systems that were reviewed employed membership standards for participants, but the use of other risk controls was far from uniform. Some systems limited credit risks by attempting to ensure that credit extensions were collateralised, either by securities received by the participant during the processing cycle or by other securities. But very few systems imposed a binding collateral requirement, in the sense that completion of a securities transfer to a participant was conditional on the availability of collateral with value greater than or equal to the resulting overdraft or funds debit balance. Likewise, only a few systems imposed binding limits (caps) on overdrafts or funds debit balances, and conditioned completion of a securities transfer on the recipient's money settlement obligation remaining beneath its cap.

Even if such stringent controls are in place, however, systems should establish a clear understanding as to how losses and liquidity pressures from a participant's failure to repay a credit extension would be distributed. Even a binding collateral requirement cannot eliminate such losses or pressures. It is always possible, and in a market collapse it is quite likely, that the liquidation value of the collateral will fall short of the amount of credit extended. Moreover, the value of the collateral would usually not be realisable sufficiently quickly to allow the system to meet obligations to participants in a timely fashion. For example, a sale of the collateral may not be settled for several days. For collateral to be useful in meeting liquidity pressures, it may therefore be necessary to have in place a commitment from one or more banks to lend against the collateral in specified amounts or at specified discounts.

As far as they go, the analysis and conclusions in the DVP Report are equally applicable to cross-border settlements. In fact, the only inherent differences between risks in domestic settlements and in cross-border settlements are differences in legal risks and the potential for foreign exchange settlement risks to arise in a cross-border context. By definition, in a cross-border settlement at least one of the counterparties to the trade is located outside the country in which settlement takes place. Consequently, as discussed further in Annex 3, legal risks that arise in a cross-border settlement may be affected by laws in the country in which the non-resident counterparty is located and, therefore, may differ from legal risks in settlements between resident counterparties in the country in which settlement takes place. In particular, the assessment of legal risks in cross-border settlements is often complicated by choice of law and conflict of laws issues. Choice of law issues relate to ambiguities as to which law most appropriately governs the relationship between the parties involved. Conflict of laws issues arise when the laws of two or more countries that apply to a transaction require different results.

The other inherent difference stems from the need for non-resident counterparties to effect money settlements in foreign currencies. A non-resident usually needs banking facilities in the country of issue of the currency used in the settlement, and it may be able to meet a substantial part of its liquidity needs in the local market.[16] Nonetheless, a non-resident may often need to supplement its liquidity in the local currency by drawing on liquidity in its home country and converting the proceeds into the local currency through foreign exchange transactions. As discussed in a recent report by the Committee, the settlement of foreign exchange transactions involves replacement cost risks and liquidity risks similar to those that exist in securities settlements.[17] In addition, because of differences in the hours of operation of national payment systems, DVP is rarely achieved in foreign exchange

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16 As noted earlier, global custodians sometimes provide their customers with a package of cash management services that eliminates the investor's need to manage liquidity demands in foreign currencies.

17 See Bank for International Settlements (1993).

settlements. Consequently, counterparties to foreign exchange transactions typically face principal risks, which are commonly termed Herstatt risks in reference to the losses of principal suffered by counterparties of Bankhaus Herstatt following its failure in 1974.

More important than these inherent differences, however, is the fact that the analysis presented in the DVP Report is limited in certain respects, and those limitations are generally far more significant in a cross-border context than in a domestic context. By far the most important limitation is that the DVP Report focused heavily on the settlement by individual CSDs of trades between their direct participants. Even in domestic settlement systems, many buyers and sellers of securities are not direct participants in the CSD. Participation is typically restricted to banks and broker-dealers, and many banks and broker-dealers choose not to participate directly. Instead, they hold their securities and settle their trades through custodian banks (local agents). But, as discussed in the previous section, in a cross-border context the use of local agents or other intermediaries for holding securities and effecting settlements is pervasive, and the DVP Report's focus on direct participants is a critical limitation.

The involvement of other intermediaries in the settlement process heightens the importance of several issues that received little or no attention in the DVP Report. Perhaps the most basic issue is that when a non-resident (or any other party) holds its securities through an intermediary, it is exposed to custody risk - the potential loss of the securities held in custody in the event that the intermediary becomes insolvent, acts negligently or commits fraud. The degree of custody risk is influenced by a variety of factors. These include the legal status of the securities, the accounting practices and safekeeping procedures employed by the custodian, the custodian's choice of sub-custodians and other intermediaries, the contractual allocation of the risk of loss, and the law governing the custody relationship. The accounting practices and safekeeping procedures employed by the custodian and sub-custodians may be the most important factors in determining the non-resident's risk of loss. Separation (segregation) of the non-resident's assets from the assets of the custodian and other customers is often the key to protecting the investor's interests.

Shortfalls in custodial holdings may develop for a number of reasons, including the failure of trades to settle as anticipated, poor accounting controls, or intentional fraud. The shortfalls may be temporary or long-standing. Allocation of the risk of loss from a shortfall will vary depending on the circumstances under which the shortfall arose. If the custodian is solvent, the risk of loss from direct acts of the custodian may be small. If, however, the custodian is insolvent, or the shortfall arises from fraud or insolvency on the part of a sub-custodian or CSD, the investor's risk of loss may be severe. In a cross-border context, the involvement of multiple legal jurisdictions and multiple settlement intermediaries increases the importance of custody risks and greatly complicates their analysis.

Another issue that increases in importance when intermediaries other than a CSD are involved is the settlement of so-called back-to-back trades and the opportunity costs and liquidity risks that arise if such trades cannot be settled efficiently. A back-to-back trade is a pair of transactions that requires a counterparty to receive and redeliver the same securities on the same day. As discussed in Section 3, securities dealers frequently need to settle back-to-back trades. However, the settlement of back-to-back trades by dealers (resident or non-resident) that are not direct participants in the local CSD poses difficulties in some settlement systems. In those systems dealers must often pre-position securities or borrow securities to meet delivery obligations. These requirements can add significantly to intermediation costs and, therefore, may significantly reduce secondary market liquidity. Securities that cannot be delivered out cannot be used to obtain secured financing. As a result, dealers incur higher financing costs and may also be exposed to greater liquidity risks, because unsecured financing tends to be less reliable, especially when financial markets are under stress. While the DVP Report highlighted the costs and risks to participants of holding cash balances and the lending of funds by CSDs to mitigate such costs and risks, it largely ignored the opportunity costs and risks that sometimes arise on the securities side when settlement of back-to-back trades is not possible and also largely ignored the lending of securities by CSDs (or, more often, by local agents) to mitigate those costs and risks.

A third issue that is quite important in a cross-border context but that was not addressed in the DVP Report is the risks associated with cross-system settlements, that is, settlements effected through links between securities transfer systems. Increases in cross-border trading and in the demand for back-to-back settlement of such trades have encouraged the development of such links. But cross-system settlements often involve significant inefficiencies that derive from the need for the transfer systems to exchange information on whether the two counterparties have the securities and funds (or access to credit) necessary to complete settlement. In particular, the settlement of back-to-back trades in which one or both settlements are cross-system settlements is often not possible, so that dealers are obliged to pre-position or borrow securities to complete such settlements.

Special problems can arise in cross-system settlements when one or both transfer systems are what the DVP Report termed model 3 DVP systems. Model 3 DVP systems make provisional transfers of securities that are not final until money settlement is completed later in the day (or on the following day in the case of systems that process instructions for settlement on S during the evening of S-1). For example, a model 1 DVP system may be linked to a model 3 DVP system. By definition, the transfers on the books of the model 1 system are final when processed. However, the transfers on the books of the model 3 system may remain provisional for many hours after they are processed. If a participant in the model 1 system receives securities across the link from the model 3 system, the status of that transfer is unclear. Either the model 1 system has received a provisional credit of securities in an otherwise final system or the model 3 system has made a final transfer of securities even though its overall processing remains provisional. This uncertainty about the finality of transfers between dissimilar systems can be exacerbated if the model 1 system permits securities received from the model 3 system to be redelivered during its own internal processing cycle. The model 1 system is then effectively granting final credit for a security that is only provisionally credited in the model 3 system.

As discussed in the DVP Report, many model 3 DVP systems provide for unwinds if a participant defaults on its settlement obligations. In such systems, a participant's failure to cover its money settlement obligation may lead to unwinds of transfers involving that participant, including transfers of securities from that participant to participants in other settlement systems. At a minimum, the unwinding of such transfers would adversely affect counterparties of the defaulting participant. However, depending on how losses are borne or allocated by the system that received the provisional transfers, others among its participants that were not counterparties to the other system's defaulting participant could also be adversely affected.

In general, the risks associated with cross-border settlements, and how significantly they differ from those involved in direct settlement in the local CSD, depend on the trading and financing patterns of non-resident counterparties and on the specific services provided by the intermediaries that they employ to hold their securities and settle their trades. Consequently, the remainder of this section considers separately the specific issues that arise when institutional investors and securities dealers effect settlements through one of the three most frequently utilised channels - settlement through a local agent, settlement through a global custodian and settlement through an ICSD.[18]

4.2 Settlement through a local agent

A local agent typically holds securities and settles trades for non-residents through an account that it maintains at the local CSD. Usually the customers' securities are segregated from the local agent's own securities on the books of the CSD. In most cases, the customers' securities are held collectively in a single omnibus account, although some CSDs offer custodians the option of setting up sub-accounts for individual customers. Trades of non-residents which settle through a local agent

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[18] Although settlement through a CSD-to-CSD link is not explicitly considered, when these links are used to effect cross-border settlements the costs and risks are similar to the costs and risks incurred in cross-system settlements involving the ICSDs.

generally settle according to the same rules and procedures as any other trades settled by the CSD; thus, such non-residents are, in effect, indirect participants in the CSD. In that case, the settlement risks arising in cross-border trades settled through this channel are in many respects identical to the risks faced by direct participants in the local CSD. Whether principal risk exists depends on whether the local CSD achieves DVP. Replacement cost risks depend on the volatility of the security's price and on the interval between trade and settlement. If the counterparties agree to conform to the local market settlement interval, replacement cost exposures would be essentially the same as those faced by direct participants.[19]

Even if the settlement interval conforms to the local market convention, in some other respects the risks faced by a non-resident settling through a local agent differ from the risks faced by a direct participant in the local CSD. As was noted above and as is discussed in more detail in Annex 3, the involvement of intermediaries in the holding of securities and the settling of trades necessarily creates new legal relationships and new risks. Perhaps the most basic difference in risks is that the non-resident faces custody risk - the potential loss of the securities held in custody in the event that the local agent becomes insolvent, acts negligently or commits fraud.

In addition to custody risk, a non-resident counterparty that utilises a local agent may face greater cash deposit risks. As noted earlier, CSDs typically extend substantial amounts of intraday credit to their participants, thereby enabling them to settle trades with smaller cash balances than would otherwise be necessary. Unless local agents are equally willing to extend intraday credit to non-resident counterparties, such counterparties would be compelled to hold larger balances than direct participants to effect their trades, implying higher opportunity costs and greater cash deposit risks.

The amounts of intraday credit required to obviate the need for the cash balances and mitigate the associated risks depend on the number and timing of processing cycles in the local funds and securities transfer systems and the timing of finality in those systems.[20] In a model 1 DVP system, a non-resident buyer would need to prefund on S-1 if confirmation of payments for value S occurs only after the CSD's deadline for crediting cash balances for use during the processing cycle for S. In DVP models 2 or 3, a non-resident seller would be forced to accept delayed availability if funds transfers resulting from the securities processing cycle are not final until after the deadline for inputting funds transfer instructions for value S.

To reduce the need for balances and the associated risks, in a model 1 DVP system the local agent would need to allow non-resident buyers to overdraw their funds accounts. In model 2 or model 3 systems, the local agent would need to accept instructions to wire out funds prior to, and in anticipation of, settlement. In either case, the local agent is exposed to credit risk and liquidity risk in the event that the non-resident fails to repay the credit extension, and would need to develop internal controls to manage those risks.

Non-resident securities dealers that settle through local agents may also need considerable volumes of intraday securities loans if they are to avoid substantial opportunity costs and liquidity risks. The need for such securities loans can arise in the settlement of back-to-back trades, which, as noted earlier, has become increasingly important as trading of European government

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19 Counterparties to cross-border trades sometimes choose to settle according to the rules established by the International Securities Market Association (ISMA), which currently provide for settlement on the seventh calendar day after the trade date. Because local market rules often provide for settlement on the third business day after the trade date (T+3), the use of ISMA rules often implies a longer settlement interval and, therefore, greater replacement cost risks. However, ISMA recently decided to change its rules to provide for T+3 settlement, with effect from 1st June 1995.

20 This discussion extends the analysis in the DVP Report along the same lines as a recent report by the Morgan Guaranty Trust Company of New York, Brussels office, as operator of the Euroclear system. See Morgan Guaranty Trust Co. (1993).

securities and related derivative products has grown and as dealers have come to rely more heavily on repos and reverse repos in their financing and position-taking.

The settlement of back-to-back trades by non-residents and other trade counterparties that are not direct participants often poses a dilemma for local agents when local CSDs: (1) process securities transfer instructions in a single processing cycle; and (2) provide local agents with a single omnibus securities account for their customers rather than with individual sub-accounts. With only a single processing cycle, the local agent must input the instruction to deliver out the securities prior to the processing cycle and, therefore, prior to receipt of the security. If its customer fails to receive the security, its instruction to deliver the security may nonetheless be executed, using securities held for other customers of the local agent.[21]

In such systems, if the local agent inputs a customer's instruction to deliver out the securities in anticipation of the customer's receipt of the securities during the same processing cycle, it is, in effect, extending an intraday securities loan to the customer. If the securities are not received as anticipated, the intraday loan becomes an overnight loan. In such circumstances, if the local agent does not own the securities itself, it would need to borrow them, either externally (often via a reverse repo) or internally (from another of its customers). If it fails to do so, it creates a shortfall in its custodial holdings, which may give rise to significant custody risks for other holders of those securities. Local agents attempt to minimise the need to borrow securities, and the risk of shortfalls if they are unable to do so, by prematching settlement instructions with the local agents employed by their customers' counterparties. Usually, they attempt to prematch the instructions to receive securities before prematching instructions to deliver out securities.[22] Even when instructions are prematched, however, some instructions inevitably fail to settle as anticipated.

An alternative solution to problems in settling back-to-back trades through omnibus accounts at CSDs is for a local agent to settle both trades on its own books. Such a local agent is effectively operating a securities transfer system. This is possible only if all counterparties involved in the back-to-back trades use the same local agent. However, custody and settlement are highly concentrated businesses in many local markets, and in some markets local agents have reportedly encouraged further concentration by introducing lower fees for trades that can be settled internally, that is, on the local agent's own books.[23] However, while settling trades internally reduces the costs and risks described earlier, it does not eliminate them. A local agent's customers expect it to settle their trades with counterparties that are direct participants in the CSD and with counterparties that use other local agents, including back-to-back trades in which the customer is receiving securities from such counterparties for redelivery internally.

Finally, in some local markets (for example, the United States), the need for back-to-back settlements is reduced significantly by the operation of multilateral trade netting systems. However, these netting systems typically do not include all trade counterparties or all transactions. In particular, membership tends to be restricted largely to securities dealers, and financing transactions (for example repos) may be excluded. Consequently, even with a multilateral trade netting system the settlement of back-to-back trades could remain a significant issue in markets in which the local CSD employs a single batch processing cycle and dealers' trades are settled through omnibus accounts at the CSD. In any event, the design and operation of multilateral trade netting systems for securities

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[21] If the securities of the customer seeking to settle back-to-back trades were held in its own individual sub-account, the failure to receive the securities would preclude execution of the instruction to deliver out the securities, because CSDs typically do not execute delivery instructions unless securities are available in the account (or can be borrowed).

[22] At least one CSD offers this same type of prematching service to an interdealer broker in its local market. Instructions for delivery and receipt of the same security are identified through a special transactions reference number and the instruction to deliver is processed if, and only if, the instruction to receive is already matched.

[23] As will be discussed later, the ICSDs settle substantial volumes of trades on their own books and charge fees for such internal settlements that are a small fraction of the fees for external settlements.

raise significant public policy issues, similar to those raised by proposals to create multilateral netting systems for foreign exchange contracts.[24]

4.3 Settlement through a global custodian

As in the case of settlement through a local agent, the risks associated with a non-resident counterparty's settlement through a global custodian are similar in many respects to the risks faced by a direct participant in the local CSD. The similarities reflect the fact that a global custodian settles the non-resident counterparty's trades through a local agent acting as sub-custodian. The local agent, in turn, usually settles those trades through an account that it maintains at the local CSD, subject to the local CSD's rules and procedures. Thus, whether the settlement of a non-resident's trades through a global custodian entails principal risk depends on whether the local CSD achieves DVP. Replacement cost risks are largely determined by the volatility of the security's price and by the settlement interval in the local market.

Here again, an important issue is the extent to which settlement through a global custodian exposes a non-resident counterparty to custody risk. The essence of the custodial relationship is contractual. A global custodian and its customer will generally bargain and reach agreement with respect to the obligations and risks that each party is willing to assume. A key question is which party bears the risks of insolvency, negligence or fraud on the part of a sub-custodian. The global custodian may provide guarantees regarding the performance of the sub-custodians that it selects. More typically, the custody contract provides that the customer bears the risk of loss arising from the use of sub-custodians. The resulting risk may be substantial. The sub-custodian has no direct contractual relationship with the global custodian's customer and in most cases would have no knowledge of the customer's interest in the securities it holds. The risk borne by the customer is instead controlled by the contract between the sub-custodian and the global custodian. Thus, a non-resident that settles through a global custodian may have difficulty in assessing the degree of custody risk created by the sub-custodian's involvement in holding its securities and settling its trades.

A variety of services provided by global custodians significantly affect the risks in settling trades through this channel. As noted earlier, a global custodian enables its customers to access multiple local markets through a single gateway featuring standardised communications channels and standardised reports. By eliminating the need to master the use of multiple communications channels and message formats, this tends to mitigate operational risks involved in settling trades.[25] Also, like other settlement service providers, global custodians extend credit to their customers to facilitate their efforts to minimise opportunity costs and related risks. In particular, global custodians offer integrated cash management and foreign exchange services. On the securities side, the institutional investors that form the customer base at global custodians seldom need to settle back-to-back trades, and most global custodians apparently do not provide the intraday securities loans that are required to efficiently settle such trades. However, in recent years institutional investors have been attaching increasing importance to earning income from lending securities from their portfolio, which may eventually force global custodians to enhance their capabilities to turn securities around.[26]

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[24] For an analysis of the public policy issues associated with multilateral netting of foreign exchange contracts, see Bank for International Settlements (1990).

[25] However, use of a global custodian concentrates the customer's operational risks. Consequently, the reliability of the global custodian's systems is critical to the customer.

[26] As institutional investors begin to manage their securities inventories more actively in search of income, they may increasingly need to settle back-to-back trades. For example, if an investor seeks to earn income from securities lending up to the date on which it sells the security, it will need to deliver out the securities lent on the same date on which it receives them back.

As part of their efforts to permit efficient cash management by their customers, many global custodians offer special services designed to reduce liquidity pressures on their customers from failed trades or delays in receiving interest, dividends or tax refunds. These services - contractual settlement date accounting (CSDA) and contractual income collection respectively - reduce a customer's uncertainty about positions in particular currencies and, in some cases, eliminate its need to engage in complex multi-currency cash management. There is a danger, however, that customers and global custodians could misunderstand the nature and risks of these services. Any credits to the investor's cash account that reflect payments that were not actually received by the custodian on the settlement date are usually provisional credits. If payment is not received within a timeframe established by the custodian, the provisional credits will usually be reversed. If the investor fails to understand the provisional nature of these credits, it may underestimate its credit exposures to its counterparties or to the securities issuers. Also, the reversal of provisional credits might lead to substantial, unanticipated demands for liquidity. This is especially true in instances where the custodian does not establish an explicit provisional credit period, but rather provides for a "reasonable period" to be determined by itself on a case-by-case basis.

The effective management of this risk depends on the information provided to its customer by the custodian and the customer's use of that information. The custodian's systems must be capable of distinguishing and monitoring customer funds and securities balances on an available and final basis, as well as transactions that have failed to settle. Such a capability depends largely on the amount a global custodian invests in systems and administrative processes. Customers, in turn, must use the information provided by the custodian to actively reconcile contractual and actual records of securities positions.

These services also entail risks to the global custodians that provide them. In essence, the custodian temporarily absorbs an investor's liquidity pressures from failed trades and delayed income payments by granting provisional credits. The reversal of any provisional credits, however, may create an overdraft in an investor's account. The custodian could suffer a credit loss if the investor fails to cover the overdraft. To control such exposures, a global custodian needs to have in place effective control and administrative processes to track failed settlements and delayed payments, to age such transactions, to follow up on outstanding transactions, and to reverse transactions that have been outstanding over a certain period. Ideally, a custodian should also have explicit credit limits for each customer concerning the amount of outstanding failures to deliver securities or funds receivable that it may incur. It does not appear, however, that global custodians generally institute such credit controls, but rather rely on their ability to track and resolve outstanding transactions in order to keep the risks within acceptable levels.

4.4 Settlement through an ICSD

As noted earlier, the ICSDs were originally set up to provide settlement and custody services for Euro-bonds. However, in recent years they have established links to dozens of local markets, and settlements of trades in domestic securities (primarily European government bonds) now account for more than 80% of their total turnover. These links allow ICSD participants to settle trades with other participants in the same ICSD, with participants in the other ICSD, or with local market participants (counterparties that participate in the local CSD or settle directly or indirectly through a local agent). Settlements of trades with other participants in the same ICSD are termed internal settlements, because they can be effected on the ICSD's own books and do not require actions by other settlement systems. Settlements of trades with participants in the other ICSD (via the link between the two ICSDs, the "bridge") and settlements of trades with local market participants (via a local market link) are termed cross-system settlements. As shown in Table 4, in 1994 about 63% of the total volume of ICSD settlements were internal settlements, about 14% were cross-system settlements over the bridge, and about 23% were cross-system settlements via local market links.

Table 4

Average daily turnover in the ICSDs (1994)

(in billions of US dollars)

	Euroclear	Cedel	Total
Internal settlements[1]	57.6	12.6	70.2
Bridge deliveries[2]	7.6	8.0	15.6
Deliveries via local market links[3]	19.5	6.5	26.0
Total turnover	84.7	27.1	111.8

[1] Internal receipts. [2] Deliveries received from the other system across the bridge. [3] Receipts and deliveries through local market links.

The costs and risks incurred in an internal settlement through an ICSD can differ significantly from the costs and risks involved in settling in the local market. Economies of scale and a high degree of automation allow the ICSDs to charge fees for internal settlements that are often much lower than settlement fees charged by local agents. The risks associated with internal settlements are determined by the ICSD's rules and procedures and by the services that it provides, which can differ significantly from the rules and procedures in the local market and the services provided by local agents. The ICSDs are best thought of as model 1 DVP systems; although transfer instructions are processed in a series of batches during the night before the settlement date rather than on a real-time basis, within each batch processing cycle individual transfer instructions are settled on a gross rather than a net basis. Because DVP is achieved, internal settlements do not involve principal risk, even if principal risks arise in the local market. On the other hand, replacement cost risks may currently be higher than in the local market because the interval between trade and settlement is longer. ICSD participants often choose to settle according to the rules established by the International Securities Market Association (ISMA), which, as noted earlier, currently provide for a longer settlement interval than most local markets. When ISMA implements T+3 settlement in mid-1995 this difference in replacement cost risks will disappear for most securities.

Internal settlements of trades by the ICSDs can often be effected with smaller securities balances and cash balances than would be required if a local agent were employed, implying lower opportunity costs, liquidity risks and cash deposit risks. On the securities side, same-day turnaround of internal receipts for internal delivery is always possible, whereas, as already discussed, in some local markets securities dealers that are not direct participants in the CSD may be required to pre-position securities or borrow securities to meet their delivery obligations.

On the cash side, extensions of credit by the ICSDs, combined with the timing of their processing cycles and their reporting of processing results, greatly facilitate their participants' efforts to economise on their holdings of cash balances. Credit is extended by allowing pre-advices of funds to be received on S to be used during night-time processing on S-1 and by permitting overdrafts on funds accounts. Because funds positions are reported early in the European business day, for most currencies participants can cover overdrafts or wire out excess funds on S, without incurring overdraft charges or losing opportunities for the investment of funds received.[27] Lower cash balances imply lower opportunity costs and smaller cash deposit risks. In addition, the reporting of results early in the day reduces liquidity risks by reducing uncertainty about funding requirements and by allowing more time to meet the requirements.

Of course, extensions of credit to participants expose the ICSDs to credit and liquidity risks. They seek to minimise these risks by imposing credit limits and collateralisation requirements on their participants and by maintaining credit lines with their cash correspondents in the various

[27] This is possible if the cut-off time for funds transfers in the local market occurs after the reporting of results by the ICSDs.

local markets. Nonetheless, the risks associated with these credit extensions may be greater than the risks associated with credit extensions by local CSDs or local agents because the duration of the exposures is generally longer. The exposure is created during the night of S-1 and is not extinguished until payment is received from the participant. Given the hours of operation of the various national payment systems, funds transfers from participants are often not final until quite late on S.[28] The collateralisation of such credit exposures diminishes the risks, but the benefits of collateralisation may in some cases be limited by choice of law and conflict of laws issues, which can create ambiguities about the effectiveness of the liens on securities.

In contrast to internal settlements, the costs and risks involved in cross-system settlements of trades between ICSD participants and local market participants are heavily influenced by local market practices. DVP is achieved only if the local CSD achieves DVP, and the settlement interval typically follows the local market convention.[29] Moreover, the design and operation of many of the links to the local markets require ICSD participants to maintain higher balances of cash or securities than are necessary to settle trades in the local market, or require the ICSDs to extend substantial amounts of credit to obviate the need for the higher balances.

The basic source of these inefficiencies in cross-system settlements is that a settlement can be completed only if the seller has sufficient securities (or access to a securities loan) and if the buyer has sufficient funds (or access to credit). In a cross-system settlement, determining that both conditions are satisfied requires an exchange of information between the two systems. Depending on the number and timing of settlement cycles, this exchange of information can take one or even two days to complete. In such circumstances, the seller may be required to pre-position (or borrow) securities and the buyer may be required to pre-position (or borrow) funds one or two days before the settlement date. Such requirements imply substantial opportunity costs for participants, especially for securities dealers that engage in back-to-back trades. In some cases, however, the ICSDs have loaned funds or securities on a subsidised (or even uncompensated) basis to mitigate the costs and risks to their participants. Of course, such facilities simply shift the costs and risks to the ICSDs rather than reducing them.

These same inefficiencies until recently added significantly to the costs and risks involved in cross-system settlements between participants in the two ICSDs effected via the bridge between the two systems. However, enhancements introduced in September 1993 largely eliminated the inefficiencies and the associated costs and risks. A full description and analysis of the bridge, including the recent enhancements, are provided in Annex 4. In summary, under the old bridge arrangement, both Cedel and Euroclear performed a single batch processing of delivery instructions for any settlement date S. Consequently, the necessary exchange of information about the availability of funds and securities balances could not be completed in a single day. This created inefficiencies, especially for Cedel and its participants. In particular, if a Cedel participant sought to complete delivery of securities to a Euroclear participant for settlement on S, it needed to pre-position the securities in its account on S-1. If it did not have the securities, however, Cedel would attempt to arrange a securities loan and would subsidise its participant by waiving the usual borrowing fee. Cedel would then block the securities and transmit the settlement instructions to Euroclear for processing during Euroclear's night-time cycle. If the Euroclear participant had sufficient cash (or credit), the delivery would become final on S and be reported back to Cedel and (by Cedel) to the Cedel participant. If the Cedel participant did not have the securities available until S, it would not receive the funds until S+1. To remain competitive with Euroclear, however, Cedel subsidised its

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[28] For example, payments of US dollars by participants are typically made through the Clearing House Interbank Payments System (CHIPS). Such payments are typically not final until 23:00 or later (Central European Time).

[29] Here again, the counterparties may choose to settle according to ISMA rules, which until mid-1995 would usually imply a longer settlement interval and, therefore, greater replacement cost exposures.

participants by backvaluing cash receipts from securities deliveries.[30] Still, under the old bridge arrangement it was not possible for a Cedel participant to receive a security from a Euroclear participant for value S and turn around the security for on-delivery to a Euroclear participant for the same value date (to settle back-to-back trades of that pattern).

Under the new bridge arrangement, both Cedel and Euroclear transfer files containing proposed deliveries and feedbacks of accepted and rejected deliveries several times each night and run several batch processing cycles in order to release securities for delivery from one run to the next. With this agreement in place, the necessary exchange of information about the availability of securities and funds (proposed deliveries and feedbacks) can be completed during the same night. Consequently, a Cedel participant that has received a security on S can redeliver that security to a Euroclear participant on S, even if it was received from a Euroclear participant. Thus, the costs to Cedel participants of pre-positioning securities (and the costs to Cedel of providing subsidies) have largely been eliminated, and Cedel participants can settle back-to-back trades with Euroclear participants.

Settlements of trades between ICSD participants and local market participants continue to pose difficulties. Specifically, as illustrated in Chart 4, the processing cycles for the local settlement systems typically occur during the local business day and, therefore, after the ICSDs' processing and settlement cycles have been completed. In such cases, an ICSD participant cannot settle back-to-back trades in which it receives securities in the local market and seeks to deliver the same securities to another ICSD participant or back to the local market.[31] Instead, it must pre-position the securities on S-1 and incur added financing costs and liquidity pressures, or it must borrow the securities during the ICSD's night-time processing cycle. The ICSDs have developed programmes that provide what are effectively intraday securities loans in anticipation of local market receipts. Such intraday loans are usually provided free of charge or at a fraction of the cost of overnight securities loans. In some cases, however, the effectiveness of these intraday lending programmes is significantly limited by the size of the pools of lendable securities held by the ICSDs.

The ability to settle efficiently back-to-back trades involving local market participants has become increasingly important because of the growing use of repos in trading and financing European government securities. Some of the most active ICSD participants tend to trade securities with other dealers that settle through the ICSDs, while they tend to engage in repos with local market participants.[32] In some cases, the inefficiencies associated with cross-system settlements have prompted dealers to employ both an ICSD and a local agent in settling trades. All trades with other ICSD participants are settled in the ICSDs, while all trades with local market participants are settled through the local agent. The link between the dealer's ICSD and its agent in the local market is used only when necessary to rebalance securities holdings in the two locations. In other cases, the high costs of cross-system settlements have prompted some dealers to settle all of their trades, including trades with other ICSD participants, through a local agent.

The risks involved in extending credit to facilitate cross-system settlements and the actual and potential movement of settlement activity to local markets have motivated the ICSDs to attempt to improve the efficiency of their local market links. To this end, the ICSDs have supported the introduction by local CSDs of multiple processing cycles - at a minimum, one cycle before the

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30 The subsidies associated with waiving securities borrowing fees and backvaluing cash receipts were costing Cedel $65 million to $70 million per year.

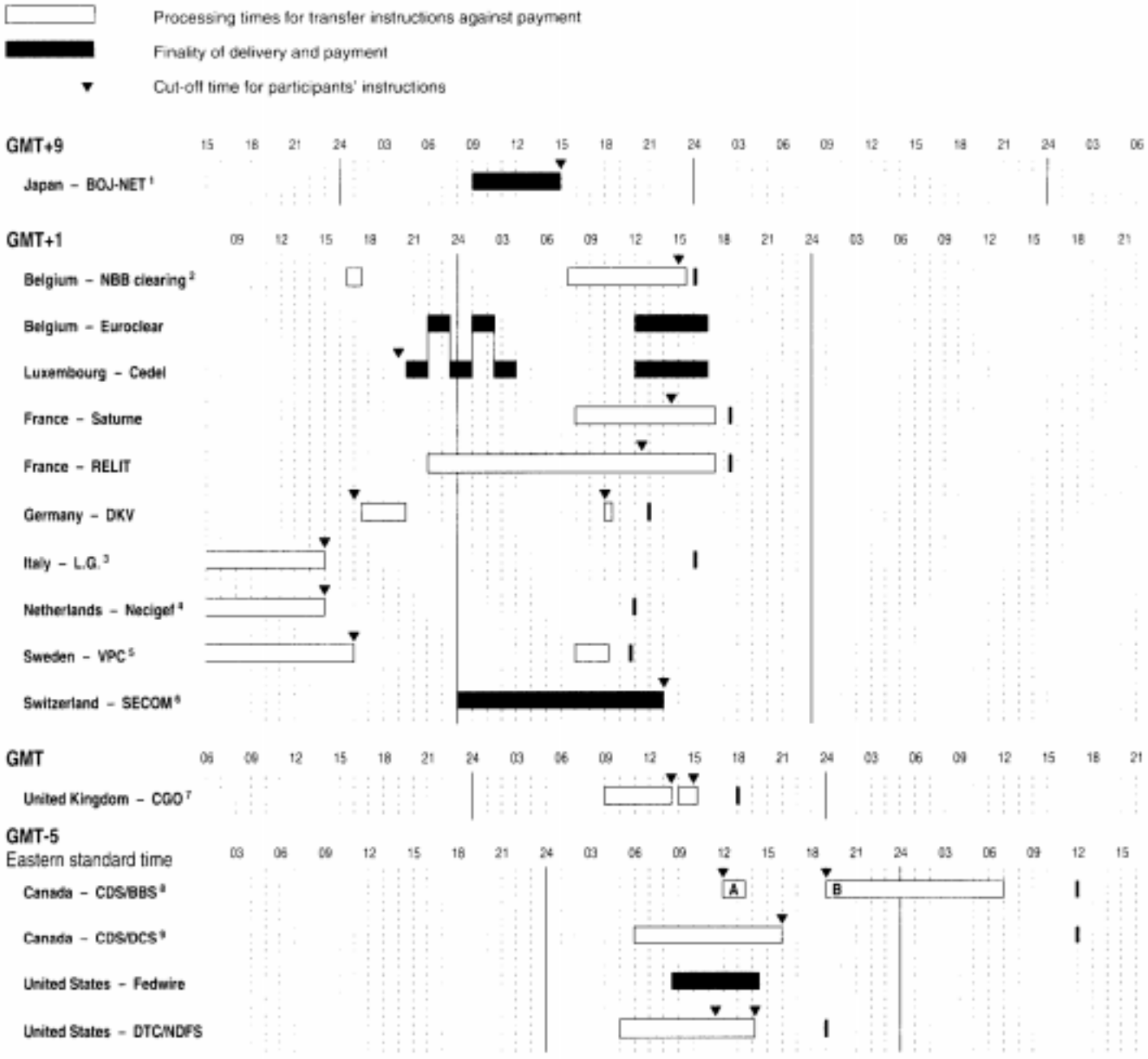
31 By contrast, back-to-back trades in which an ICSD participant receives securities from another ICSD participant and delivers the same securities to a local market participant usually do not pose difficulties, provided that the cut-off time for entering transfer instructions in the local market is not so early as to preclude the processing of deliveries from ICSD participants that become available during their night-time cycles.

32 Repos are sometimes settled in the local market because such transactions can be arranged on settlement day, whereas in the ICSDs it is not currently possible to settle on a same-day basis.

Chart 4

Processing cycles for selected securities settlement systems

(instructions for execution on the same day (S))



[1] Offers real-time settlement facility (9:00 – 15:00) and batch settlement facility (settlement at 15:00).

[2] Processing in the evening of S-1 only for settlements across linkage with ICSDs.

[3] Daily settlement of government securities and corporate bonds; instructions for value S are processed from 13:30 on S-2 to 14:30 on S-1.

[4] Instructions are processed (from trade date) until 15:00 on S-1.

[5] In principle, instructions are processed from trade date until 17:00 on S-1 for all securities; trades in money market instruments may be processed until 10:15 on S.

[6] New system linked to SIC (as from February 1995); instructions can be processed from 0:00 to 22:00.

[7] Sales instructions are processed from 9:00 to 13:30 on S (from 8:00 on the day following a gilt auction); pledges from 14:00 to 15:15 on S.

[8] Book Based System for provincial and corporate debt, equities and strips. There are two processing cycles: payments for cycle A (12:00 to 13:30 on S) are final at 12:00 on S+1; payments for cycle B (19:00 on S to 7:00 on S+1) are final at 12:00 on S+2 (not shown).

[9] Debt Clearing System for Government of Canada domestic marketable bonds only.

night-time processing cycles at the ICSDs and one cycle after. For example, as described in Annex 5, in 1993 the German CSD introduced a same-day processing cycle (after the ICSDs' night-time processing cycles), while maintaining its standard processing cycle (before the ICSDs' processing cycles). This allows ICSD participants to complete same-day turnarounds of securities, regardless of from whom they are received (the local market or an ICSD participant) or to whom they are delivered.

As discussed earlier, a serious weakness of some of these links to local markets is that the transfers from the local market resulting from the evening processing cycle are not final until money settlement occurs the next day. If a local market participant were to fail to meet its money settlement obligations, provisional transfers of securities from that participant to ICSD participants might be unwound. Thus, these links create significant credit and liquidity interdependencies between the systems - disruptions from a settlement failure in the local market would promptly be transmitted to the ICSDs and their participants, possibly including participants that did not trade with the defaulting local market participant.

Even if CSD-to-CSD links (including those involving the ICSDs) are not vulnerable to unwinds of provisional transfers, they create significant operational interdependencies between settlement systems and can also create credit and liquidity interdependencies. An operational problem at one CSD would result in a failure to complete deliveries between their participants, which could affect the completion of deliveries at other CSDs, including CSDs not directly linked to the CSD with the operational problem. Furthermore, the provision of settlement services by linked CSDs has the potential to create credit and liquidity interdependencies. Such exposures arise when one CSD provides another CSD with a cash account and settles trades between its own participants and participants in the other CSD by debiting or crediting the other CSD's cash account. In effect, the second CSD is a participant in the first CSD and, like other participants, it may request and be granted substantial extensions of credit to enable it to avoid the opportunity costs associated with the need to prefund payments or to accept delayed availability of receipts.

Credit demands are likely to be especially large in links that allow settlements in multiple currencies. While prepayment or delayed availability may not be a problem in the case of the local currency or the currencies of countries in the same time zone as the first CSD, without such credit extensions currencies of countries in later time zones would need to be prepaid, and currencies in earlier time zones would not be available for investment.[33] CSD-to-CSD credit extensions eliminate the opportunity costs of such cash requirements, but only by creating CSD-to-CSD credit exposures. As with credit exposures to participants, the duration of such exposures depends on the hours of operation of national payment systems.

5. IMPLICATIONS OF CROSS-BORDER SETTLEMENTS FOR CENTRAL BANK POLICY OBJECTIVES

5.1 Central bank policy objectives

Central banks have an interest in the design and operation of securities settlement systems because of their implications for central bank policy objectives relating to financial stability and the containment of systemic risk and to the effectiveness of central bank oversight of payment and settlement systems. Central banks have broad responsibilities for the stability of the financial system as a whole. In particular, as lenders of last resort, they are usually at the centre of efforts to contain threats to financial stability. These responsibilities require central banks to identify sources of

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[33] As an example of a case in which no CSD-to-CSD credit extensions are made, in the link between the Swiss CSD (SEGA) and the German CSD (DKV), cash accounts are maintained at local settlement banks rather than at the CSDs and any credit extensions would be made by those local settlement banks.

systemic risk and to consider how such risk can be diminished. Central banks are especially concerned about potential disturbances to payment and securities settlement systems and to money markets because such systems and markets are relied upon as vehicles for the execution and transmission of monetary policy. Because of these special concerns, central banks oversee developments in their domestic money markets, especially interbank markets, and in payment systems.

The failure of a large trader or settlement intermediary to meet its obligations could produce liquidity pressures or credit losses on a scale sufficient to threaten the stability of the financial system as a whole. In particular, a disturbance in a securities settlement system could spill over to money markets or to payment systems. Indeed, the potential for such spillovers has probably increased in recent years because of the increased importance of repos as money market instruments and the increased use of securities collateral to control risks in payment systems. Given these changes, if securities, especially government securities, cannot be transferred safely and reliably, the functioning of money markets and payment systems is likely to be seriously impaired.

Although all of the G-10 central banks are concerned about the potential for securities settlement systems to be a source of systemic disturbance, the extent to which they are directly involved in the operation or oversight of securities settlement systems varies from country to country. Seven of the G-10 central banks actually operate securities settlement systems, usually systems for settling trades in government securities (Table 5). Some of the G-10 central banks also play a role in the oversight of privately operated settlement systems, although in other cases such oversight is the responsibility of securities supervisors or is shared by central banks and securities supervisors. The division of responsibility has often been influenced by central bank policy decisions. In at least one G-10 country, settlement volumes are sufficiently small relative to turnover in payment systems or the depth and liquidity of money markets for the central bank to see no need to play an oversight role. In most cases, however, policy decisions about the degree of involvement in oversight seem largely to reflect judgments about how best to address moral hazard issues.

All of the G-10 central banks are conscious that the incentives for participants in securities settlement systems to control the riskiness of their activities can be weakened if they perceive that central banks will absorb risks or take action to limit their systemic consequences. A few central banks have concluded that the best way to minimise moral hazard is to minimise their role in the operation or oversight of securities settlements. They believe that concerns about the potential for disturbances to securities settlements to adversely affect money markets and payment systems can be addressed by strengthening payment systems. For example, some central banks have applied the Lamfalussy standards to the payment systems through which payment obligations associated with securities transfers are settled,[34] while others have allowed securities settlement systems to use central bank accounts for money settlements (see Table 5). As noted earlier, the use of central bank money eliminates cash deposit risks for participants that have access to central bank funds accounts. Other central banks believe that significant moral hazard can exist in privately operated securities settlement systems regardless of the extent of their involvement in oversight and seek to be actively involved in oversight so as to influence the systems' design and operation. In particular, several central banks have emphasised the importance of establishing explicit loss-sharing rules that are consistent with their expectation that private market participants will bear any credit losses associated with a settlement failure.

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[34] The Lamfalussy standards is the name commonly given to the minimum standards for the design and operation of cross-border and multi-currency netting and settlement schemes. See Bank for International Settlements (1990).

Table 5

Group of Ten central banks
Involvement in securities settlement systems

System operator

National Bank of Belgium: NBB Clearing System
Bank of England: CGO, CMO, ESO
Bank of France: Saturne
Bank of Italy: LDT, CAT
Bank of Japan: DVP-NET (development of BOJ-NET)
Netherlands Bank: Clearing Institute of the Netherlands Bank
Federal Reserve: Fedwire

Settlement bank

Bank of France: SICOVAM
Deutsche Bundesbank: DKV
Netherlands Bank: Necigef[1]
Sveriges Riksbank: VPC
Swiss National Bank: SEGA
Federal Reserve: DTC[2], PTC

Neither

Bank of Canada: CDS
Federal Reserve: DTC[2]

[1] The use of central bank funds for wholesale transactions is under development. [2] The Federal Reserve Bank of New York is the settlement bank for the DTC's same-day funds settlement system. Money settlement in the DTC's next-day funds settlement system is currently via cheques drawn on commercial banks, but plans call for merging the two systems and settling in central bank funds by late 1995 or early 1996.

5.2 Implications for systemic risks

The DVP Report defined systemic risk in a securities settlement system as the risk that the inability of one institution to meet its obligations when due will cause other institutions to fail to meet their obligations when due. The Report noted, however, that this is a very broad definition that covers some events that are unlikely to be of serious concern to central banks. For example, the failure of one institution to deliver a security often causes the institution that had anticipated receipt of the security to fail to meet its obligation to redeliver the security. Central banks are primarily concerned with potential credit losses or liquidity pressures that are on such a scale that they cannot be managed and contained within existing contractual and banking arrangements. Such losses or pressures could threaten the stability of payment systems and financial markets if spillover effects caused widespread difficulties at other firms, in other market segments or in the financial system as a whole. The evolution of a systemic crisis generally involves an initial shock that causes the failure of one or more major financial institutions, which, in turn, impairs the financial system in at least one of three key areas: settlement, credit allocation or the holding or pricing of financial assets.

As discussed earlier, the DVP Report focused heavily on the management by individual CSDs of their credit and liquidity exposures to their direct participants. By its nature, a CSD concentrates settlement activity and related credit and liquidity risks. In particular, the Report emphasised that nearly all CSDs extend substantial amounts of intraday credit to their participants and that the failure of a major participant to repay such credit extensions could create liquidity pressures or losses of sufficient magnitude to create systemic problems. Thus, an important determinant of the degree of systemic risk in a securities settlement system is the effectiveness of the risk controls that a

CSD imposes to limit potential liquidity pressures and credit losses from the failure of one or more of its direct participants.

Perhaps the single most important conclusion of this study is that, in analysing risks in securities settlements, greater attention must be paid to other intermediaries in the settlement process. Even in domestic securities trades, multiple intermediaries (in addition to CSDs) are often involved in the custody of securities or the settlement of securities trades. These intermediaries may include banks acting as custodians or money settlement agents, clearing corporations that compare and net trades, money managers and securities brokers and dealers. The performance of these intermediaries is a critical factor in the timely completion of settlement and access by participants and their customers to final settlement proceeds and securities. The failure of any intermediary in the settlement process to meet its obligations could create systemic credit and liquidity problems, especially if settlement activity were centralised in the intermediary, as it is in CSDs, clearing corporations (where one exists), money settlement agents, and often custodians. As has been noted repeatedly, the use of additional settlement intermediaries is pervasive in cross-border settlement arrangements. As a result, risks in cross-border settlements tend to be concentrated in such intermediaries, especially in the ICSDs and in certain local agents, to a greater degree than is typically the case in domestic settlements.

The potential for financial or operational problems at one of these intermediaries to cause systemic problems is most clearly evident in the case of the ICSDs. The ICSDs are now involved in a significant portion of total settlement activity for certain European government securities. To facilitate such settlements, especially cross-system settlements, the ICSDs extend substantial amounts of credit to their participants and to one another. Moreover, because of differences in the hours of operation and the timing of finality between the ICSDs and the various national securities and funds transfer systems, the duration of these exposures is often considerably longer than that of the exposures faced by local CSDs. The risk controls imposed by the ICSDs - binding credit limits and collateral requirements - are far more stringent than those usually imposed by local CSDs. Nonetheless, the risks involved are quite substantial and have been growing rapidly. The ICSDs have attempted to strengthen their local market linkages in ways that would reduce the credit demands of their participants and the associated risks, but, as has been discussed, the lack of intraday finality in many local systems has limited the effectiveness of these efforts and created new sources of risk. If, despite its efforts, an ICSD were to experience a significant financial or operational problem, the effects would be transmitted rapidly to numerous local markets through the linkages that have been established.

Although the operations of the ICSDs and their implications need to be understood more clearly, a significant conclusion of this report is that the potential for other intermediaries involved in cross-border settlements to be a source of systemic disturbances also needs to be carefully examined. As discussed in the previous section, local agents in some markets have reportedly attracted the critical mass of customers necessary to settle significant volumes of trades internally. Such agents are a critical component of the local market infrastructure, and systemic problems could well emerge if their financial or operational integrity were impaired. Moreover, the rules and procedures under which trades are settled on the books of such intermediaries and the risk controls that they impose are typically far less transparent than the rules, procedures and controls of the ICSDs. Bankruptcy or fraud at a major custodian could also have systemic implications, even if the intermediary does not settle trades on its own books. The consequences of a significant shortfall in the securities needed to meet the claims of custody customers could be quickly transmitted throughout the financial system. The direct custody customers could experience a sharp decline in their net worth and might lack the assets needed to obtain secured financing. If the custodian maintains accounts for other custodians, the financial integrity of the other custodians and their customers could be undermined.

In general, the potential for disruptions to cross-border settlement arrangements (whether they involved the ICSDs, other key non-resident intermediaries or large non-resident traders) to cause systemic problems is heightened by the difficulties that central banks and other national authorities would be likely to encounter in containing a disturbance. Such containment difficulties might arise

because of choice of law and conflict of laws problems, because non-residents had limited access to liquidity, or because of limitations on national authorities' ability to intervene effectively.

Choice of law and conflict of laws problems might create uncertainty regarding the finality of transfer, ownership interests or collateral rights. In particular, such problems might complicate the use of collateral to mitigate credit exposures arising in cross-border transactions. In addition, differences in bankruptcy law could result in uncertain or conflicting outcomes regarding the disposition of securities in the event of a counterparty's or intermediary's insolvency. Predictability of outcome is essential in efforts to contain financial problems, but widely divergent legal frameworks make predictability hard to achieve in a cross-border context.

Disturbances might also be difficult to contain because of difficulties in obtaining liquidity. Non-resident counterparties to cross-border securities trades, and also key non-resident intermediaries involved in settling such trades, might encounter difficulties in obtaining adequate liquidity in order to complete settlement in a timely manner, particularly during periods of market stress. Access by non-resident counterparties or intermediaries to local money markets, credit lines and repos or securities loans might be severely limited, either because their creditworthiness is more difficult for local lenders to ascertain or because of legal concerns or limitations on participation in local money markets. Time zone differences could complicate efforts by non-residents to meet funding requirements by tapping liquidity sources in their home country and exchanging the proceeds for balances in the local currency.

Relevant national authorities (central banks and securities supervisors) might also face difficulties because of coordination problems, limitations on existing supervisory tools and limited access to lender-of-last-resort facilities by non-residents. Unresolved questions of extraterritoriality and allocation of transnational oversight responsibilities could further constrain a national authority's flexibility and effectiveness in responding in a timely manner to a cross-border systemic crisis. Addressing cross-border systemic disruptions would generally require coordinated action by the authorities affected in several countries.

5.3 Implications for central bank oversight

The critical role in cross-border settlement arrangements played by intermediaries other than the local CSD poses challenges to central bank oversight of domestic money markets and payment and settlement systems. The most basic challenge stems from the lack of transparency in cross-border settlement arrangements. The use of multiple channels for settling cross-border trades and the involvement of multiple intermediaries entail considerable complexity. Even after publication and dissemination of this study, central banks are unlikely to have as clear an understanding of cross-border arrangements as they do of their domestic systems, in which settlement procedures tend to be more uniform and more information tends to be available about the activities and financial condition of key intermediaries.

Another basic challenge stems from the concentration of settlement activity in home country securities in foreign intermediaries, including global custodians and especially ICSDs. If foreign investors and securities dealers play an important role in the markets for home country securities, such foreign settlement intermediaries can constitute an integral part of the settlement system for those securities. For example, the ICSDs have unquestionably come to be an integral part of the settlement systems for certain European government securities. In such circumstances, the rules and procedures of these foreign intermediaries are a potential source of systemic disturbances to the settlement process for home country securities and, thereby, to domestic money markets and payment systems. A central bank and other domestic authorities may find, however, that they have only limited influence over the relevant rules and procedures.[35]

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[35] The central bank or other home country authorities would be able to exert some influence if their approval is required in order to establish and maintain the link with the home country CSD.

If a systemic disturbance were to arise from a cross-border settlement arrangement, the home country central bank might face special challenges in containing it, for the reasons noted earlier. To begin with, the home country central bank may learn of the disturbance more slowly. Containing the disturbance would probably require the cooperation of central banks, banking supervisors and securities supervisors in several jurisdictions. And the complexity of the arrangements, their lack of transparency and the need to deal with multiple legal jurisdictions could hinder their efforts.

ANNEX 1

GLOSSARY

Back-to-back trades

A pair of transactions that requires a counterparty to receive and redeliver the same securities on the same day. The transactions involved may be outright purchases and sales or collateral transactions (repurchase agreements or securities loans). For example, a securities dealer might buy and sell the same securities for the same settlement date in the course of making markets for customers or it might buy securities for inventory and finance the position through a repurchase agreement.

Book-entry system

An accounting system that permits the electronic transfer of securities without the movement of certificates.

Bridge

The "bridge" is the name commonly used for the link between Euroclear and Cedel that permits cross-system settlement of a trade between a participant in one ICSD and a participant in the other ICSD.

Cash deposit risk

The credit risk associated with the holding of cash balances with an intermediary for the purpose of settling securities transactions.

Central securities depository (CSD)

A facility for holding securities which enables securities transactions to be processed by means of book entries. Physical securities may be immobilised by the depository or securities may be dematerialised (so that they exist only as electronic records).

Choice of law

The determination of which law most appropriately governs the relationship between parties involved in the settlement of a securities transaction.

Conflict of laws

A situation in which two or more sets of laws that appropriately apply to a particular transaction require different results.

Contractual income collection

A contractual commitment by a custodian to credit a customer's cash account with interest, dividend or tax refund payments on the date on which the payments are scheduled, regardless of whether the custodian has actually received the payment. Usually such credits are provisional and are reversed if the custodian does not receive the payment within an interval established by the custodian.

Contractual settlement date accounting (CSDA)

A contractual commitment by a custodian to credit and debit a customer's cash and securities accounts, as appropriate, on the date on which the customer's contract with its counterparty provides for settlement (the contractual settlement date), regardless of whether settlement has actually occurred. Usually these credits and debits are provisional and are reversed if settlement does not occur within an interval established by the custodian.

Credit risk

The risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. Credit risk includes replacement cost risk, principal risk and cash deposit risk.

Cross-border settlement

A settlement that takes place in a country other than the country in which one trade counterparty or both are located.

Cross-border trade

A trade between counterparties located in different countries.

Cross-system settlement

A settlement of a trade that is effected through a link between two separate securities transfer systems.

Custodian

An entity, often a bank, that safekeeps and administers securities for its customers and that may provide various other services, including clearance and settlement, cash management, foreign exchange and securities lending.

Custody

The safekeeping and administration of securities and other financial instruments on behalf of others.

Custody risk

The risk of loss of securities held in custody occasioned by the insolvency, negligence or fraudulent action of the custodian or of a sub-custodian.

Delivery

Final transfer of a security or financial instrument.

Delivery versus payment

A link between a securities transfer system and a funds transfer system that ensures that delivery occurs if, and only if, payment occurs.

Depository receipt

An instrument issued in one country that establishes an entitlement to a security held in custody in another country.

Domestic settlement

A settlement that takes place in the country in which both counterparties to the trade are located.

Domestic trade

A trade between counterparties located in the same country.

Failed transaction

A securities transaction that does not settle on the contractual settlement date, usually because of technical or temporary difficulties.

Final transfer

An irrevocable and unconditional transfer which effects a discharge of the obligation to make the transfer. The terms “delivery” and “payment” are each defined as a final transfer. See provisional transfer.

Global custodian

A custodian that provides its customers with custody services in respect of securities traded and settled not only in the country in which the custodian is located but also in numerous other countries throughout the world.

Gross settlement system

A transfer system in which the settlement of funds or securities transfer instructions occurs individually (on an instruction-by-instruction basis).

Internal settlement

A settlement that is effected through transfers of securities and funds on the books of a single intermediary. An internal settlement requires both counterparties to maintain their securities and funds accounts with the same intermediary.

International central securities depository (ICSD)

A central securities depository that settles trades in international securities and in various domestic securities, usually through direct or indirect (through local agents) links to local CSDs.

Issuer

The entity that is obligated on a security or financial instrument.

Legal risk

The risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced.

Liquidity risk

The risk that a counterparty will not settle an obligation for full value when due, but on some unspecified date thereafter.

Local agent

A custodian that provides custody services for securities traded and settled in the country in which it is located to trade counterparties and settlement intermediaries located in other countries (non-residents).

Net settlement system

A system in which transfer orders are settled on a net basis. Some systems distinguish between types of transfer orders and settle some, such as payment orders, on a net basis and settle others, such as securities transfer orders, on an instruction-by-instruction basis.

Payment

The satisfaction and discharge of a monetary obligation by the debtor's final transfer of a claim on a party agreed to by the creditor. Typically, the party is a central bank or a commercial bank.

Principal risk

The risk that the seller of a security delivers a security but does not receive payment or that the buyer of a security makes payment but does not receive delivery. In this event, the full principal value of the securities or funds transferred is at risk.

Provisional transfer

A conditional transfer in which one or more parties retain the right by law or agreement to rescind the transfer.

Replacement cost risk

The risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the settlement date. This failure may leave the solvent party with an unhedged or open market position or deny the solvent party unrealised gains on the position. The resulting exposure is the cost of replacing, at current market prices, the original transaction.

Repurchase agreement (repo)

A contract to sell and subsequently repurchase securities at a specified date and price. Also known as an RP or buyback agreement.

Same-day funds

Money balances that the recipient has a right to transfer or withdraw from an account on the day of receipt.

Securities loan

A loan of securities, with or without collateral, to facilitate timely fulfilment of settlement obligations.

Settlement

The completion of a transaction, wherein the seller transfers securities or financial instruments to the buyer and the buyer transfers money to the seller. A settlement may be final or provisional.

Settlement date

The date on which the parties to a securities transaction agree that settlement is to take place. The intended date is sometimes referred to as the contractual settlement date.

Settlement interval

The amount of time that elapses between the trade date (T) and the settlement date (S). Typically measured relative to the trade date, e.g. if three days elapse, the settlement interval is T+3.

Systemic risk

The risk that the inability of one institution to meet its obligations when due will cause other institutions to be unable to meet their obligations when due.

Trade date

The date on which a trade/bargain is executed.

Transfer

An act which transmits or creates an interest in a security, a financial instrument or money.

ANNEX 2

REPURCHASE AGREEMENTS AND SECURITIES LOANS: SETTLEMENT IMPLICATIONS

Introduction

The growth of repurchase agreement and securities lending transactions has been spectacular in recent years. Whereas such markets had been quite important for some time in certain countries, including the United States and Japan, they became significant in the Euro-markets only in the second half of the 1980s and in several other domestic markets, including France and Belgium, even more recently.[1]

Repurchase agreement transactions and securities loans both give rise to the transfer of securities through existing custody and settlement arrangements. As a result of the expansion of these markets, the share of securities transfers related to such transactions has become quite substantial in many domestic and international securities settlement systems. Many settlement systems are supporting the growth of such transactions through the development of special services.

The development of repurchase agreement and securities lending transactions contributes to more efficient and less risky securities settlement arrangements. One important purpose of such transactions is to allow market participants to avoid fails in securities settlements. In a cross-border context, markets for repos and securities loans provide securities market participants with an indispensable market mechanism for avoiding fails when the settlement interval in the local market differs from the settlement interval established for international securities under the rules of the International Securities Market Association (ISMA).

Transaction types

For purposes of this study, securities loans, repos, reverse repos and buy/sell transactions are collectively called collateral transactions. A **securities loan** is an agreement in which securities are lent to a counterparty, usually against cash or other collateral.[2]

A range of transactions are covered by the term repurchase agreement transaction. The most common are repos and reverse repos and buy/sell transactions. A **repo** consists of a two-part transaction. The first part involves the transfer of specified securities by one party, the repo seller, to another party, the repo buyer, in exchange for an agreed amount of cash. The second part consists of the contemporaneous, linked agreement by the seller to repurchase the securities at a specified future date or on demand, at a price which is specified. A **reverse repo** is the same transaction viewed from the perspective of the buyer. Thus, a sale of a security with an agreement to buy it back is a repo. A purchase of a security with an agreement to sell it back is a reverse repo. Master agreements have become a common feature of the repo market. The master agreement clearly links the two parts of the transaction, may provide for margin, and clarifies the rights of each party in the event of default.

The second most common form of repurchase agreement transaction is the **buy/sell transaction**. In a buy/sell transaction the parties contemporaneously enter into two separate trades in respect of the same security. A sale of the security is arranged for normal or same-day settlement; a forward trade is arranged for the seller to repurchase the security on a set date. This transaction can serve the same purpose as a repo, but may be used when repo transactions are restricted. Buy/sell arrangements are generally not covered by master repo agreements because of the desire of the parties to preserve the independent identity of the two parts of the transaction.

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1 There is also a sizable market for repos on German government securities in London.

2 Although in most transactions the loan is collateralised, this is not always the case.

Repos fall into one of three maturity categories - overnight, open or term. An **overnight repo** is one that matures on the day following its original settlement date; the repo securities are then returned to the seller and the repurchase price is paid to the buyer. An **open repo** has an indefinite term. Either party may terminate the transaction on demand. A **term repo** has a set maturity of more than one day.

Repo transactions are also differentiated by the arrangements for custody of the repo securities. There are "delivery" repos, tri-party repos and hold-in-custody repos. In a **delivery repo**, the seller transfers control of the repo securities to the custodian of the purchaser on the original settlement date and the buyer transfers control of the repo securities to the custodian of the seller at maturity. If the securities are transferred on a delivery versus payment basis, this custody arrangement minimises the purchaser's credit exposure to the seller. However, the transaction costs of delivery repo may be quite high, which generally reduces the rate of return that the seller is willing to pay, especially for transactions with short maturities.

In a **tri-party repo** the seller and buyer agree to use a common custodian for the repo securities. The tri-party custodian agrees to monitor the repo transaction to ensure that each party is fulfilling its obligations to the other. This includes reviewing the securities to see that they conform to the agreement, marking the securities to market and making appropriate margin calls. The most important function the tri-party custodian serves is to ensure that the seller's repurchase obligation to the buyer is at all times fully secured (in market value terms) by collateral (either securities or cash). A tri-party repo arrangement should reduce the transaction costs associated with a delivery repo without increasing the credit exposure of the buyer. This type of repo should also ensure that the seller can efficiently arrange substitutions of repo securities.

In a **hold-in-custody repo**, the repo seller retains custody of the repo securities on behalf of the buyer. This arrangement involves the lowest transaction costs and the greatest risk to the buyer. Thus, the rate of return paid by the seller tends to be higher than in a delivery or tri-party repo. In addition to the operational and credit risks incurred by the buyer, there may be legal issues that arise when the seller retains control of the repo securities.

The relationship between collateral transactions and securities settlements

Given the rapid growth of collateral transactions in many market centres, the share of settlements of such transactions in the total turnover in securities settlement systems could be expected to have increased noticeably in recent years.[3] Unfortunately, estimates are available for only a few systems. Euroclear and Cedel estimate the share of repos in their against-payment transfers to be around 30%, and in both cases repos are said to constitute the fastest growing element of turnover. In France the share of repo-related transfers in total SATURNE turnover has risen from 30 to 50% between 1992 and 1994; in the case of RELIT the share amounts to roughly 20-25%. Finally, in Sweden, repos represent more than 40% of securities transfers in the VPC system, with foreigners accounting for the bulk of this activity. While the share of securities turnover relating to securities loans is typically smaller, it is estimated that such transactions account for about 10% of total securities settlements (that is, including those outside SECOM) in Switzerland. Table 1 presents qualitative assessments of the relative significance of different types of collateral transactions in each of the G-10 countries.

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[3] However, the effects would depend to a large extent on the custody arrangements used. Hold-in-custody repos require no transfer of collateral, and tri-party repos often involve transfers only on the books of the common custodian. Only delivery repos are likely to involve transfers on the books of CSDs, which are typically what is captured in turnover statistics.

Table 1

Qualitative significance of various collateral transactions

Countries	Repurchase transactions				Securities loans
	Repos			Buy/sell transactions	
	Delivery	Tri-party	Hold-in-custody		
Belgium	***↗	-	-	***↗	**↗
Canada	***↗	-	*	***↗	***↗
France	***↗	*	**↘	*	*↗
Germany	n.a.	n.a.	n.a.	-	*↗
Italy	***↗	-	-	***↗	*↗
Japan	-	-	-	**	**
Netherlands	-	-	-	-	*
Sweden	-	-	-	***	*↗
Switzerland	-	-	*	*↗	**↗
United Kingdom[1]	-	-	-	-	**↗
United States	***	***↗	***↘	**	***↗
International markets	**	*↗	*	***	**↗

[1] Entries relate to transactions in domestic instruments only.

*** = important; ** = moderately important; * = exists, but not very much used; - = non-existent; ↗ = importance increasing; ↘ = importance decreasing; n.a. = not available.

The relationship between collateral transactions and securities settlements is of a reciprocal nature. On the one hand, the infrastructure for securities settlements as well as various market settlement practices or regulations support the development of the collateral transactions markets. On the other hand, the existence of collateral transactions facilitates the timely settlement of securities transactions, including cross-border transactions.

Effect of settlement arrangements on collateral transactions

It is doubtful whether the markets for collateral transactions could have developed to the extent that they have without the improvements in custody and settlement arrangements for securities that have been implemented in recent years. The establishment of CSDs and the related move to book-entry transfer systems have increased the efficiency of the transfer of securities. Banks have generally improved their custody services to support market needs; some large custodians offer securities settlement services on their own books. The increased availability of DVP has attracted participants to the market that were previously discouraged by the custody risk entailed in a hold-in-custody repo.

CSDs and custodians are often the key providers of services for securities lending and repo transactions. They may offer standing or ad hoc lending and borrowing facilities, often through the creation of a so-called pool of lendable securities. For repo transactions, some CSDs and custodians offer participants the possibility of using special transfer instructions that will automatically generate the redelivery of securities at maturity.

Market practices or regulations relating to securities settlements may also have contributed to the rapid expansion in collateral markets in recent years. One factor is the general move to rolling settlement. In effect, the implicit credit which participants extend to one another under account settlement arrangements has become explicit under rolling settlement through the use of securities lending and repos. Moreover, the reduction of settlement intervals has significantly increased the need for market participants to be able to draw on cash and securities lending facilities to meet their settlement obligations. In some cases stiffer penalties for settlement fails have also heightened the importance of access to such facilities.

Effect of collateral transactions on the efficiency of settlement

Collateral transactions contribute directly to reducing risk and increasing efficiency in the settlement of securities transactions. Indeed, sellers of securities which, for one reason or another, do not have the securities available in their securities account with the settlement agent (CSD or custodian) on the settlement day can often obtain the necessary securities through securities borrowing or repo transactions. Collateral transactions thus reduce the potential for failed securities transactions.

The potential negative effects of settlement failures have become more significant with the general increase in active securities trading, the expansion of back-to-back transactions and the growth in cross-border trading. In fact, it is increasingly common for domestic securities to be traded by international dealers on a back-to-back basis between domestic and international market participants. Table 2 shows that settlement intervals differ considerably across G-10 countries and in the international market. When the same security is traded under ISMA rules in the international market - with a settlement lag of seven calendar days (three business days as from 1st June 1995) - and under domestic rules in the domestic market, the dealer is often exposed to the risk and cost of settlement failure if it cannot rely on securities borrowing or repo facilities. This is illustrated in Chart 1.

Table 2

Settlement intervals
Securities markets in the G-10 countries

Country	Instrument type	
	Government securities	Equities
Belgium	T+5[1]	T+3
Canada	T+5	T+5
France	T+3[2]	T+3
Germany[3]	T+2	T+2
Italy	T+3	Monthly cycle[4]/T+5[5]
Japan	T+10[6]	T+3
Netherlands	T+7[7]	T+7[7]
Sweden	T+3	T+3
Switzerland	T+3	T+3
United Kingdom	T+1	T+10[8]
United States	T+1[9]	T+5[10]
International[11]	T+7[7,10]	T+7[7,10]

Note: T+N means that settlement is scheduled to occur N business days after the trade date, with exceptions noted.

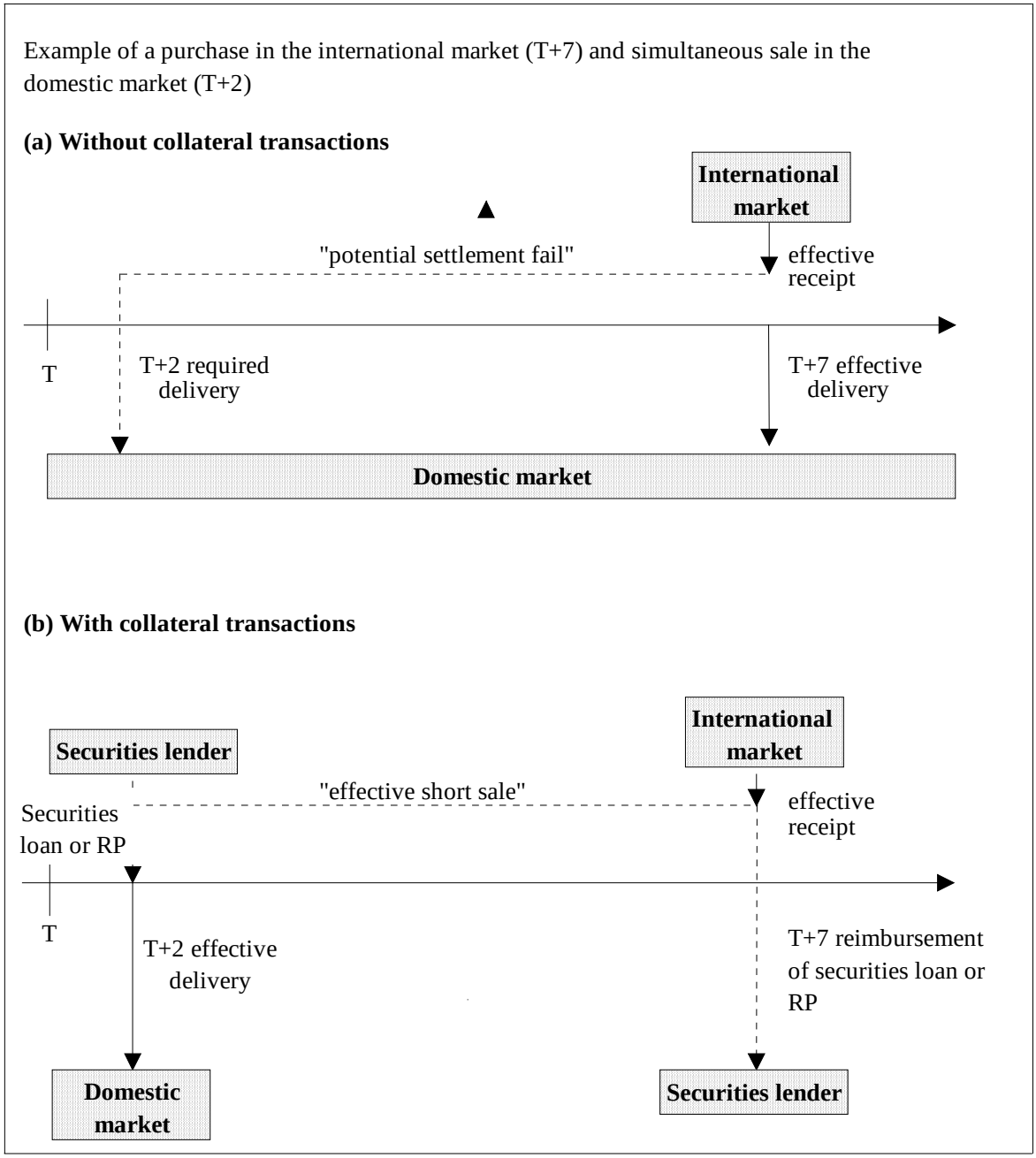
[1] For bonds; T+2 for bills. [2] For bonds; T+1 for bills and notes. [3] For trades on exchanges; OTC trades T+0 to T+40. [4] Trades executed during the last two weeks of a month and the first two weeks of the subsequent month are settled during the last half of the second month. Thus, settlement is scheduled to occur 15 to 45 days after the trade date. [5] 200 low-volume equities (out of more than 330 listed on the stock exchange) are settled on T+5. [6] 10 days or less. [7] 7 calendar days, that is, usually 5 business days. [8] Scheduled to be reduced to 5 days in 1995. [9] Mortgage-backed securities issued by government agencies are settled on a monthly cycle. [10] Scheduled to be reduced to 3 days in 1995. [11] Trades in Euro-bonds and other international securities settled under the rules of the International Securities Market Association (ISMA).

Collateral transactions also facilitate cross-border securities settlements involving linkages between settlement systems. Indeed, cross-system settlements frequently require market participants to pre-position securities or to accept delayed deliveries. As a result of the lack of synchronisation of the processing cycles of linked settlement systems, it often is difficult to achieve

same-day turnaround for cross-system settlements. Part of the costs and risks has been covered implicitly by the various intermediaries such as ICSDs or local agents. Increasingly these intermediaries are making explicit the costs and risks involved in achieving same-day turnaround by requiring participants to enter into collateral transactions to complete such settlements. These range from automatic securities lending facilities and repo tracking mechanisms to an explicit intraday securities lending facility introduced by Euroclear in June 1994.[4]

Chart 1

Use of collateral transactions to reduce settlement failure



[4] This facility is called Receipt Anticipation Borrowing and Lending (RABL). RABL enables participants to borrow securities to cover delivery commitments where the participant anticipates receipt of the securities needed to make the deliveries across a link to a system that processes securities later on the same day.

ANNEX 3

LEGAL ISSUES IN SECURITIES SETTLEMENTS

Background

In the early stages of this study, the study group decided to investigate the legal issues arising in securities settlements. Although this study grew out of the DVP Report, there had been no corresponding effort to define the legal issues associated with DVP or with domestic securities transactions generally. In many respects a domestic securities transaction and a cross-border transaction are identical: the parties want to complete a transfer of an effective interest in securities in exchange for payment in available funds. The legal issues that arise in a cross-border transaction often represent a more complex formulation of the basic questions that arise in any securities transfer.

A wide disparity exists among countries with respect to the law governing securities transactions, making a complete survey of the law of all of the Group of Ten countries impractical. The present review therefore concentrates on identifying and discussing legal issues of general concern in a cross-border securities transaction.[1]

Introduction

The smooth flow of securities settlements and the safe custody of securities investments are essential to the international capital markets. Public and private investment, private capital formation, government finance and secured lending all hinge on public confidence in the mechanisms for issuing, settling and holding securities. As more payment systems look to securities collateral to control credit risk in the settlement process, those systems also become dependent on the ability to acquire and maintain an enforceable interest in securities.

Market participants have worked hard to simplify the flow of securities across borders through the development of global custody networks, international central securities depositories (ICSDs) and links between national central securities depositories (CSDs). The ability to transfer securities in book-entry form has been the basis for these developments. The availability of book-entry settlements makes it possible for settlement systems, CSDs and custodians to offer comparable settlement services in a wide range of national markets. The reliability and efficiency of these services permit market participants to develop trading and investment strategies based on rapid repositioning of funds among those markets.

However, the comparability of settlement services masks important distinctions between the legal frameworks that may be applied to the same securities in different countries. The decision to favour one type of market participant over another represents a basic policy choice for each country. Although much progress has been made in the efforts to harmonise global markets, it is unlikely that a "world view" will soon develop on the legal issues. Understanding the different legal frameworks is essential to identifying and controlling the risks arising in cross-border securities transactions.

The review presented below explores the areas in which legal issues are likely to affect the rights and obligations of securities market participants. The topics covered in the following sections are:

Choice of law and conflict of laws. This section gives a general description of the problems that may arise when it is not clear which national law governs a securities transaction.

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[1] This review was prepared by MarySue Fisher, Federal Reserve Bank of New York, and Hiromi Yamaoka, Bank of Japan.

Involvement of intermediaries. The number of intermediaries typically involved in securities transactions has grown significantly over the past twenty years. This section describes the role of intermediaries in the settlement process and the longer-term role of intermediaries that act as custodians and sub-custodians. It also identifies the legal issues associated with the involvement of multiple intermediaries in a single securities transaction.

Legal status of securities. The legal framework applying to the ownership, transfer and pledging of securities varies widely from country to country. This section describes in general terms the differences that may exist, with a particular emphasis on book-entry securities.

Finality of delivery and payment. This section discusses the legal issues underlying the definition of final transfer that is used in both the DVP Report and in the body of this report.

Systemic risk. This section describes how legal issues create or contribute to systemic risk.

Bankruptcy. The potential for bankruptcy raises many legal issues in a cross-border securities transaction, which are briefly described in this section.

Regulation, taxation and exchange controls. Government action can fundamentally alter the risks and perceived benefits associated with cross-border trading and settlement. The potential effects of regulation, taxation and exchange controls depend entirely on the nature of the measures imposed. The last section of this review therefore identifies these issues as areas for exploration, but does not discuss them in detail.

Choice of law and conflict of laws

The most significant legal distinction between a domestic and a cross-border securities transaction is the potential for issues related to "choice of law" and "conflict of laws". In the context of this report, the concepts of "choice of law" and "conflict of laws" each concern the basic question of what law governs the relationship between the parties to a securities transaction.

Choice of law is the question of which law most appropriately governs a relationship between two parties. It is usually resolved by determining in which country the asserted right was acquired or which country has the strongest relationship to the entire transaction. Parties to a transaction frequently avoid choice of law problems by contractual designation of the law of a specific country as the law governing their relationship.

As the term implies, the principle of "conflict of laws" can be more problematic. A conflict of laws exists when the laws of two or more countries that appropriately apply to a particular transaction require different results. As with choice of law problems, conflict of laws problems can be reduced through contractual selection of the governing law. However, even if the parties choose a law to govern their relationship, certain situations can arise that render those choices ineffective or incomplete.

In a cross-border securities transaction, issues of choice of law and conflict of laws arise in two ways. They may present problems that would not occur in a domestic transaction and thereby become an independent obstacle to completion of a cross-border trade. More commonly, choice and conflict of laws issues complicate questions that also exist in the context of domestic securities transactions.

Involvement of intermediaries

Most securities transactions involve multiple intermediaries for the settlement and custody of securities. As a result, there are often multiple tiers of intermediaries interposed between the issuer of a security and the ultimate investor.

The involvement of each of these intermediaries creates new legal relationships and risks. The intermediaries may become insolvent, act negligently or commit fraud. The issuer seeks discharge

of its obligations, but risks performing to the wrong party. The investor risks diversion of the issuer's performance to creditors of one of the many intermediaries involved along the way.

Securities market intermediaries can be usefully divided into two categories: intermediaries which are responsible for the movement of securities through the trading and settlement process and those which maintain custody of the securities after settlement. Certain types of intermediaries, such as central securities depositories (CSDs), perform both activities.

Trading and settlement intermediaries

The basic "tiers" of intermediaries between the issuer and investor can be readily classified as agents of either the issuer or the investor. The issuer employs agents to keep ownership records and process payments. The investor uses money managers, brokers and custodians to handle securities investments. However, the mechanisms that are at the centre of modern securities markets create relationships that are more complex than can be addressed by a simple classification as principal or agent. Exchanges and centralised markets for trading securities, clearing corporations, electronic settlement facilities and CSDs are intermediaries which provide specialised services to large groups of market participants. In some respects these "central market mechanisms" resemble public utilities, offering services to each participant on a similar basis; they cannot be characterised as the agent of any particular market participant for purposes of assigning the risk of loss.

The relationship between the investor and a central market mechanism is usually indirect. Participation in the mechanism is often tied to the legal status of the institution. For example, membership in a securities exchange may be limited to individuals and firms that are licensed to trade securities in the country in which the exchange is located. Participation in a securities settlement system may be restricted to entities that are eligible to participate in a linked funds transfer system, which in many countries may be tied to the right to maintain an account at the central bank.

Even though an investor may be excluded from direct participation, central market mechanisms may have a direct effect on the investor's legal rights in securities. Settlement mechanisms often look to the securities transferred as collateral securing the settlement obligations of the participant acting on the investor's behalf. If the participant fails to meet its settlement obligations, securities which are received on the investor's behalf may be sold to satisfy the participant's debt. This will be true even if the investor had adequate funds on deposit with the participant to cover the purchase of the securities. If the participant is also insolvent, the investor may find that it is a general creditor of the failed participant, rather than the owner of securities.

The allocation of risk within a central market mechanism is usually determined by a set of rules specifically written for the mechanism and a standard form participant's agreement. The rules often determine the rights of a non-participant in the securities handled by the facility, while refusing to acknowledge those claims directly. To understand potential risks, the investor must first identify the mechanisms involved in processing its securities transactions. The investor must then determine to what extent its rights and obligations are influenced by the rules and agreements which bind direct participants.

However, investors rarely have any choice in the decision to involve these central market mechanisms in their relationship. Participants that are active in the markets execute trades, process settlements and hold securities through the intermediaries that are most efficient and least costly. A market participant that seeks to avoid these mechanisms will incur a substantial increase in its basic transaction costs.

Custodian intermediaries

One of the most basic intermediary relationships is that between the investor and the custodian it selects to safekeep its securities. The essence of the relationship is contractual. The investor and the custodian will generally bargain and reach agreement with respect to the obligations and risks that each party is willing to assume. The custodial relationship poses the longest-term risk to the investor

of all its intermediary relationships. Risk arising from the trading and settlement process may be severe, but it is of limited duration. By comparison, custody risk lasts for as long as the security is held in custody. Moreover, custody risk is principal risk; if realised, the investor's risk of loss is extreme in the event of bankruptcy, fraud or negligence on the part of its custodian.

The potential risk involved in the custody relationship is influenced by a variety of factors. These include the legal status of the securities, the accounting practices and safekeeping procedures employed by the custodian, the custodian's choice of sub-custodians and other intermediaries, the contractual allocation of the risk of loss, and the law governing the custody relationship.

The accounting practices and safekeeping procedures employed by the custodian and sub-custodians may be the most important factors in determining the investor's risk of loss. Separation (segregation) of the investor's assets from the assets of the custodian and other investors is often the key to protecting the investor's interests. This separation can be accomplished in a number of ways. Traditionally, segregation involved the physical separation of securities certificates in the custodian's vault. However, the prevalence of book-entry securities and immobilised global certificates has increased reliance on accounting entries to identify and separate customer interests.

Unfortunately, the adequacy of the accounting practices employed by custodians and sub-custodians may not be easy for the investor to evaluate. The custodian may, for example, make appropriate debits and credits to the investor's accounts, but it may not have sufficient securities to support the total number of accounting entries that it makes. If the custodian uses sub-custodians and depositories, the risk becomes more complex. The custodian may have deposited sufficient securities with the sub-custodian, but the sub-custodian may not have sufficient securities to support the entries that it has made in favour of the custodian. In each case the investor's interest in the securities may be compromised.

Shortfalls in custodial holdings may develop for a number of reasons: inefficiencies in the settlement process, poor accounting controls, or intentional fraud. The shortfalls may be temporary or long-standing. Allocation of the risk of loss from a shortfall will vary depending on the circumstances under which the shortfall arose. If the custodian is solvent, the risk of loss from direct acts of the custodian may be small. If, however, the custodian is insolvent, or the shortfall arises from fraud or insolvency on the part of a sub-custodian or depository, the investor's risk of loss may be severe.

Sub-custodians

Sub-custodians play a large role in cross-border settlements. Participation in domestic settlement systems is typically restricted to local entities. In other cases, the custodian may be unwilling to take on the risks or obligations of direct participation. Movement of securities across borders to provide direct safekeeping services is usually impractical or impossible. In either case, the custodian will select a sub-custodian to perform safekeeping services.

The investor's direct custodian may provide guarantees regarding the performance of sub-custodians that it selects. More typically, the custody contract provides that the investor bears the risk of loss arising from the use of sub-custodians. The resulting risk to the investor may be substantial. The sub-custodian has no direct contractual relationship with the investor and in most cases will have no knowledge of the investor's interest in the securities that it holds. The risk borne by the investor is instead controlled by the contract between the sub-custodian and the investor's direct custodian.

The ability of, and the incentive for, the custodian to bargain for a reduction in the investor's risk of loss will depend on the type of sub-custodian that it uses. If the sub-custodian is a private banking institution, the contract may take the form of a negotiated agreement which specifically identifies and protects the interests of the custodian's customers. If the sub-custodian is a centralised securities depository, the contract may take the form of rules and a standard form participant's agreement that may not be varied.

The potential effects on the investor are greatest in those central market mechanisms that also provide custody services. The rules adopted by CSDs may significantly alter the rights that the investor may have to identify and claim securities held through the depository. In some countries, the rules adopted by a CSD may be accorded the status of law. In those cases, identifying the country in which the investor's securities are held is not sufficient to determine the governing law. The investor must also evaluate each specific facility in the chain of intermediaries between itself and the issuer.

Multiple tiers of intermediaries

The careful choice of a custodian will clearly protect the investor from many of the risks associated with settlement and safekeeping arrangements. However, management of those risks becomes increasingly complex as the number of intermediaries rises. The risks are especially difficult to control because the tiers of intermediaries involved in securities transactions often multiply without the knowledge of the investor.

For example, most government debt of the G-10 countries is issued and traded in book-entry form. The investor must rely exclusively on bookkeeping records to identify its interest in such securities. In a typical transaction, there are a number of intermediaries between the investor and the issuer. The government issuer keeps one set of records which establishes the entire amount of the securities outstanding and the entity to which the government issuer will make payment - the record owner of the debt. In most countries this is a CSD which identifies the amount of the issue held on behalf of each of its direct participants. Those direct participants will often include ICSDs, local agents of global custodians, and CSDs operated in different countries. Each of these entities provides clearing and custody services to other institutions, including ultimate investors and other custodians.

The investor at the end of this chain of intermediaries must depend on the accuracy of the record-keeping of each intermediary to ensure the proper identification of its interest in the securities. Auditors commonly rely on a process of reconciliation to ensure that the records of each market participant match the records of the custodian that holds securities on its behalf. However, a "single tier" reconciliation process cannot ensure that appropriate bookkeeping entries are made at each level between the market participant and the issuer. If a shortfall exists at any tier above the market participant, the risk of loss rises significantly. The closer the shortfall is to the top of the chain of intermediaries, the greater its potential impact.

Although the resulting legal relationships may be unclear, the tiering of relationships is, in many respects, necessary to complete securities transactions in modern markets. Paper-based settlement of securities is increasingly rare; it is inefficient for high-volume markets and can obstruct growth in emerging markets. The 1989 recommendation of the Group of Thirty to shorten settlement cycles to three days has increased pressure to eliminate paper from securities trades. All of these factors have spurred the development of mechanisms that avoid physical delivery of paper securities in the settlement of trades.

Unfortunately, the legal uncertainty that can result from tiering of intermediary relationships is compounded by questions of governing law in a cross-border transaction. It is difficult for an investor to protect itself from the risks posed by intermediaries when it does not know who those intermediaries are or where they are located. Even the most cautious investor may be unable to determine which countries may claim jurisdiction over its transaction.

Legal status of securities

Considerable differences exist among countries with regard to the legal framework applying to the ownership, transfer and pledging of securities. These differences may affect the range of instruments that qualify as securities. They may also limit the methods available to make an effective transfer or pledge of securities.

Table 1

Comparison of legal characteristics of book-entry systems

The following examples classify book-entry systems according to their legal characteristics:

1. Legal fiction of the existence of physical securities in the book-entry system

   - Ž "Immobilisation" or "global certificates" schemes in which there exist, or the law presumes the existence of, physical securities in the book-entry system.
   - Ž "Dematerialisation" schemes in which no physical certificates are issued.

2. Existence of physical securities circulated outside the book-entry system

   - Ž Physical securities, besides the book-entry form of the respective securities, are still traded.
   - Ž All securities of the same type are dematerialised.

3. Participation in the book-entry system

   - Ž Issuers and investors have the option of participating in the book-entry system.
   - Ž Participation in the book-entry system is compulsory.

4. Convertibility between physical securities and book-entry securities

   - Ž Issuers must issue physical securities if requested.
   - Ž Issuers are no longer required to issue physical securities.

5. Legal rights of investors in the book-entry system

   - Ž Investors have claims directly on the issuer of the securities.
   - Ž Investors have only claims on the intermediaries or other entities in the book-entry system.

The legal framework for multi-tiered systems falls into one of two general types: one applies the conventional legal framework for securities to book-entry systems by presuming the existence of physical securities; the other builds a new legal framework for "dematerialised" securities that are issued solely in electronic form. Table 1 summarises the legal characteristics differentiating such systems.

The first type of arrangement relies on a "legal fiction" to fit book-entry securities into a "paper-based" legal theory. The law pretends that the securities exist in physical form. Ownership rights and the transfer and pledging of book-entry securities are then explained in terms of "possession" and "delivery" through the mechanisms of "immobilisation" or "global certificates", in which physical securities are deemed to be deposited and kept in "fungible" (interchangeable) form. An investor shown on the books of the intermediary is regarded as having "physical possession" of the respective securities and, as a consequence, acquires a "property interest" in them. The completion of book entries is deemed to have the same effect as physical delivery of the relevant securities.

A legal arrangement created for dematerialised securities may take one of several approaches. The fungible nature of book-entry securities may be explicitly recognised, leading to a new characterisation of the investor’s property interest. The investor may be treated as a co-owner of all the

securities of the type it has purchased that are held by the intermediary. The investor then retains a specific property interest in the securities but can only claim it on a proportional basis.

The legal arrangement may instead deprive the investor of its property interest in the securities and place it in a debtor/creditor relationship with the intermediary. In that case, the deposit of securities becomes analogous to a bank deposit with special characteristics. In such an arrangement, the investor's interest may be further refined. The investor's claim may be secured with the specific assets held for the investor serving as collateral for the claim. Alternatively, the investor may become part of a preferred class of creditors, with a claim that is secured generally by all securities held by the intermediary for customers.

The wide variation among countries in their legal treatment of securities raises significant issues for cross-border securities transactions. Problems may arise in a number of typical transactions. For example, dematerialised securities issued in one country may be handled in the book-entry system of a second country that relies on an immobilisation scheme and the legal fiction of possession. In that case, it may be unclear whether the dematerialised securities qualify as securities in the second country. If they do not, the transferee of the dematerialised security may acquire a legal interest which is significantly different from the one it expected.

Depository receipts

Depository receipts are often issued to avoid problems associated with the trading and settlement of foreign securities. A depository receipt is an instrument that is issued in one country to establish entitlement to a security held in custody in another country. Depository receipts are then traded and settled in the domestic market in place of the foreign securities that they represent. However, the legal status of these "quasi-securities" is not always clear. For example, a depository receipt may not entitle the investor to make a claim on the issuer of the original securities; it may only symbolise a claim on the intermediary or serve as evidence of a debtor/creditor relationship between the intermediary and the investor. Moreover, it is not clear what happens to depository receipts if the underlying securities are invalid, or if depository receipts are over-issued relative to the amount of the underlying securities.

Depository receipt programmes can raise many issues independent of the underlying securities. While they may simplify the operational aspects of cross-border investment, they may also add new risks that are not fully understood.

Finality of delivery and payment

The DVP Report used a number of legal concepts to define when a transfer becomes final. The transfer must be "irrevocable", "unconditional" and effect a "discharge" of the legal obligation to make the transfer.[2] These concepts establish the benefit and burdens of each party to a "final" transfer. The party making the transfer must do so in a way that removes its options to revoke or "undo" the transfer. In exchange, it is relieved of any further obligation to make the transfer. A DVP transaction involves two transfers. The DVP Report therefore focused on two points of finality and determined that a mismatch between finality of the securities delivery and finality of payment creates principal risk for the party that performs first. As a result, the DVP Report concluded that finality for each transfer should be simultaneous or as closely matched as possible.

In fact, there are many points in the settlement process where the issue of finality arises. In a sales transaction, the original counterparties want to achieve finality with respect to the performance called for by the contract of sale: transfer of ownership of a security in exchange for the agreed funds. An operator of a securities settlement system seeks finality of a more limited kind; it wants the acts that are performed in the settlement process to serve as the basis for a discharge of the obligation to complete a transfer that is initiated within that settlement system. Unless the seller and buyer are both direct

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2 See Bank for International Settlements (1992), Annex 2, p. A2-3. The same definition is used in this study.

participants in that system, the obligations that are created and discharged in the settlement process may be only a small part of what is necessary to achieve finality in the context of the overall sale.

Finality in the settlement process

The difficulty of coordinating delivery and payment in many markets has fostered reliance on provisional transfers to reduce the principal risk that otherwise occurs when one party performs first. The parties agree that the first performance is provisional and will only become final when the other party completes its performance. The provisional performance is reversed in the event that the other party fails to perform. This contractual adjustment of the meaning of performance may be necessary to protect the parties where transfer of the securities and payment must occur at different facilities or through different media. For example, parties often use wire transfers of funds to pay for securities delivered in physical form. Trying to coordinate the physical delivery and wire payment is cumbersome and costly. In the absence of coordination, someone will perform first. Reservation of the right to reclaim the first performance may provide some protection against the risk that the other party will fail to perform.

One of the chief reasons for the development of securities settlement systems is the desire to increase coordination of the delivery and payment processes. However, many systems continue to rely on provisional transfers to control risk arising in the settlement process. For example, many settlement systems process securities transfers for a set period of time each day; the associated payments are then settled on a net basis at the end of that processing period. If the processing of the securities transfer is final, either the sender or the settlement system bears substantial risk of loss until the net payment is made by the buyer. Although alternatives exist for controlling the risk of loss, settlement systems frequently designate all transfers as provisional until settlement is completed. The systems then look to partial or full unwinds of the day's activity in the event that a participant fails to settle. Provisionality is seen as a low-cost protection against principal risk because it can be established by contract alone.[3]

Most systems have a set of rules or operating procedures which serves as a contract among the participants and the settlement system operator. These documents may be relatively brief or they may run to several volumes. The rules are often complex and ambiguous on the key issues of when a transfer becomes "irrevocable" and "unconditional". The nature of the obligations undertaken in the settlement process may also be unclear, making it quite difficult to determine when they are discharged. In many systems, multiple rules must be read together to understand the fundamental risk features.

The complexity of the rules governing these essential points is a significant obstacle for market participants seeking to understand and allocate risk appropriately. This compounds the problems posed by the many intermediaries that may be involved in a single transaction. As described in Sections 3 and 4 of this report, cross-border settlements are often made across links between two separate settlement systems. How and when those linked settlements become final is not easy to ascertain. Unless a special agreement governs the issue of finality for transfers across the link, determining when finality occurs may require a painstaking analysis of each system's set of rules. If differences exist between the timing of finality in the two systems, those differences may create risks that are not clearly allocated among the operators and participants of each system.

Finality of the original transaction

The basic goal of any securities transaction is to transfer an enforceable interest in securities in exchange for the agreed payment. The transaction may take one of several forms. It may be an outright sale; it may be a loan in which securities are used as collateral; it may be a loan of securities

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[3] Reliance on provisional transfers and unwinds to control settlement risk has generally been viewed with disfavour by the G-10 central banks. As noted in the DVP Report, an unwind with respect to "even a single participant that fails to settle has the potential to create significant systemic risk". See Bank for International Settlements (1992), p. 23.

with cash collateral; it may be a repurchase agreement transaction. In each case the interest transferred is different, but the same settlement mechanisms are likely to be used.

Finality as defined in the DVP Report may be hard to achieve with respect to the original transaction. For example, in a contract to sell a security the seller wants to transfer ownership of the security to the buyer. The contract of sale should establish what constitutes finality between the direct parties. The seller will then take certain steps to send the security and its ownership interest to the buyer. Those steps may well be enough to transfer the seller's interest "irrevocably" and "unconditionally"; they may also be effective to discharge the seller's obligation to make the transfer.

However, many factors may intervene to frustrate the intent of the parties to create an ownership interest in favour of the buyer of the securities. The most common impediments are liens which attach during the settlement process itself. In addition, certain legal systems grant property rights in securities that arise before the settlement process begins and linger after settlement is complete. As a result, the acts sufficient to discharge the seller's legal obligation to transfer ownership may not ensure that the buyer receives an "irrevocable" and "unconditional" ownership interest. The problem of conflicting property interests in securities is most likely to arise in those situations in which the separate identity of specific securities is preserved. As long as securities remain identifiable it is easier to assert a property interest that has attached to those specific securities. For example, a victim of theft can easily establish an ownership interest in securities certificates which are registered in its name. Those certificates will retain their specific identity until they are re-registered. Certain legal systems may permit the prior owner to "trace" the securities through a series of transfers to reclaim them from a purchaser which was not involved in the theft. The fact that the securities bear the name of a claimant may not be sufficient to establish a continuing interest in them, but it does make clear which securities are subject to the claim. In this situation, the seller of the securities may make a transfer which is irrevocable and unconditional with respect to the rights of the seller. However, the seller cannot prevent the prior owner from making a claim that it is the rightful owner of the certificates.

Securities that are held in fungible form through intermediaries do not often retain a specific identity sufficient to support a claim of prior ownership. However, market participants which have lost securities through fraud or theft have a strong incentive to assert a claim against a subsequent purchaser of the securities. Those incentives may be strongest in legal systems which apply "paper-based" legal theories to book-entry and other fungible form securities. In these systems, a purchaser is theoretically subject to new claims against its securities until the end of the applicable limitation period. That period is often measured in years.

To mitigate the possible adverse effects on finality, some legal systems have developed the concept of "negotiability". This permits purchasers to buy securities and other instruments without making significant inquiries into the individual history of the securities that they buy. The purchaser may instead rely on the facts available to it at the time of the purchase to assert that it is a "holder in due course" or a "good faith purchaser". In that case, the purchaser cuts off the asserted property interest and has an irrevocable, unconditional entitlement to the securities.

The potential for creating conflicting property interests may be greatest when provisional transfers occur that are later reversed. Settlement systems and their creditors may assert liens against the securities that arise during the provisional transfer period. A provisional transfer may also be sufficient to confer an interest on the customers of the direct participant in a securities settlement system. This is most likely to occur when the provisional transfer of securities is credited to the account of a customer which has pre-positioned funds to pay for the securities. In the event that the provisional transfer is reversed, the customer may claim that it has purchased the securities and is entitled to keep them.

Such claims and conflicts are not inevitable. They may also be foreclosed by governing law or contract. However, the potential for these types of claims complicates the concept of finality as it applies to the transaction underlying a securities transfer.

Systemic risk

Legal issues contribute to systemic risk in several ways.[4] At the most basic level, market participants cannot manage their risks prudently if they cannot identify or understand them. The many tiers of intermediaries that are typically involved in processing a single securities transaction pose a challenge to the market participant that seeks to be well-informed regarding risk.

As described above, each intermediary may have its own set of contracts and rules that attempt to shift risk away from the intermediary. Although the market participant may bear the risk of loss, it may be difficult for it to determine which facilities are actually involved in the transaction. Even if the market participant is able to determine which facilities are involved, the complexity of governing rules and law may make it difficult to predict the outcome of legal issues that arise. The efforts of the market participant to protect itself against the risk posed by one intermediary may achieve inimical results with respect to other intermediaries involved in the transaction.

The reliance on securities collateral to control systemic risk may also work against the securities market participant. Many intermediaries have contracts and rules which grant the intermediary a lien on the securities which it handles during the clearing process each day. Those liens are discharged when all of the credit extended in the clearing process is repaid. If the credit is not repaid, the intermediary will retain or sell the securities in satisfaction of the debt. The problem for the market participant is that it has little control over the creation or discharge of these liens.

In the cross-border context, conflict of laws problems can contribute significantly to systemic risk. When multiple intermediaries are involved in a "chain" of custody relationships, the country in which each intermediary is located may claim jurisdiction over the same securities. If the securities "frozen" by an insolvency in one country are serving as collateral in several others, the potential for systemic consequences increases.

The best protection against the legal aspects of systemic risk is the development of a full understanding of the settlement process involved in each securities transaction. This requires identification of the potential channels for settlement and a determination of the risks that each may pose. To the extent that market participants identify risk features that are undesirable, they must seek change or avoid the facilities that have those features.

Bankruptcy

The potential for bankruptcy of one of the entities involved in a cross-border securities transaction poses challenging legal questions. Conflict of laws problems are likely to arise as each jurisdiction seeks to obtain the results that are deemed fair under its own asset distribution scheme. The schemes for distribution of the assets of a bankrupt entity vary widely from country to country. In many countries, the distribution scheme depends on the type of charter held by the entity, the type of creditor or the type of assets involved.

The most significant issues arise if the bankrupt is also an intermediary that maintains securities accounts for others. Claimants of a bankrupt intermediary are usually better protected if they can obtain securities in settlement of their claims. Thus, claimants are likely to assert that they have a property interest in specific securities to ensure priority over the claims of general creditors. If the intermediary has more claimants than securities, protracted disputes may result regarding ownership of the securities held by the intermediary.

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[4] Systemic risk is defined in Annex 1 as "the risk that the inability of one institution to meet its obligations when due will cause other institutions to be unable to meet their obligations when due".

Effective time of the order

The time at which an order of bankruptcy becomes effective is critical for a securities transaction in the process of settlement. In a number of countries, an order of bankruptcy is effective at the beginning of the calendar day on which the bankruptcy occurs (a zero-hour rule). In others, the order takes effect when entered or when the parties become aware of the order. If more than one country is involved in the securities settlement, the results may be surprising.

For example, if the bankrupt intermediary is organised in a country following the zero-hour rule, transactions processed on that day may be void and the securities returned to the sender. However, the intermediary may actually hold the securities in custody in another country which only recognises bankruptcy at the time the order is entered. If a securities transfer is made in the second country before entry of the order, the law of that country may state that the customer of the intermediary has acquired ownership of the securities transferred. In that case, both the sender and the purchaser may claim ownership of the security. The ability of each party to enforce its claim of ownership will probably depend on the location of the security at the time the bankruptcy occurs.

Charter of the bankrupt entity

Certain countries base bankruptcy distribution schemes on the type of charter held by the bankrupt organisation. Banks and securities firms may be covered by schemes designed to treat certain creditors more favourably or to minimise losses to public insurance plans. This may lead to sharing of securities holdings on a proportional basis or liquidation of all securities holdings to meet the claims of an identified class of creditors. In other cases, distribution may depend on which claimants are shown for separately identified securities on the books of the failed intermediary. The potential for loss by the claimant differs significantly under each of these plans.

Legal status of assets distributed

The question of a security's status under the law becomes critical if an intermediary becomes insolvent. As discussed above, certain countries still distinguish between securities issued in paper form and those issued in dematerialised form. The fact that each is transferred in book-entry form may be irrelevant: the paper-based book entry is treated like a security; the electronic instrument is classified as an "intangible". In those countries, the law may require different distribution of securities that previously traded on the same terms in the market. The paper-based securities can be distributed to separately identified owners. However, the dematerialised securities may become assets of the failed intermediary liquidated for the benefit of general creditors.

The same issue arises if assets are held by intermediaries in a fungible mass. The laws of certain countries provide that securities held in fungible form give rise to a claim on the intermediary rather than a property interest in the securities. However, maintenance of securities in fungible form is an almost universal practice because it increases the ease of transfer and promotes efficiency in the settlement process. An investor may bear a significant risk of loss if a failed intermediary's bankruptcy is administered under the laws of a country which characterises fungible form securities as an asset of the intermediary's estate.

The actual risk borne by the investor will depend in large part on the degree of asset segregation recognised by the distribution scheme. In many cases, the securities held by an intermediary for its customers form a special class of asset which is not available to satisfy the claims of general creditors.

Priority among creditors

The status of the creditor may also be important in determining rights in bankruptcy. Distribution schemes frequently create classes of preferred creditors. For example, "depositors" of

banks and "fully-paid" customers of securities firms may receive priority over less-favoured claimants.

Other schemes may recognise the "tiering" that occurs in the modern markets and confer priorities on one tier of claimants over the other. This tier-based priority has been described as upper-tier versus lower-tier priority. In an upper-tier priority scheme, the claims of creditors above the failed intermediary are favoured. This includes secured creditors that accepted securities collateral from the failed intermediary. Their securities claims are preferred over conflicting claims of the intermediary's custody customers (lower-tier claimants). In a lower-tier priority scheme, the claims of the custody customers prevail over conflicting claims of the upper-tier creditors.

Regulation, taxation and exchange controls

Issues relating to regulation, taxation and exchange controls are present in any cross-border securities transaction. Local regulation may limit or prohibit participation in domestic markets by foreign entities. It may also raise effective barriers to participation by imposing capital requirements, accounting standards or other conditions that are inconsistent with the regulatory standards imposed by the market participant's home country.

Local tax policy may discourage participation in foreign markets. For example, transfer taxes or taxation of operations on a "unitary" basis can make market participation too costly.

The possibility of exchange controls has a similar deterrent effect on cross-border securities transactions. A sudden restriction of capital flows, including securities transactions in the settlement process, could result in enormous risk to the participants affected.

ANNEX 4

THE LINK BETWEEN CEDEL AND EUROCLEAR: THE "BRIDGE"[1]

Before 1980 the settlement of trades between Euroclear participants and Cedel participants had required the physical delivery of securities. Each business day securities were delivered from the Euroclear depository in Luxembourg to a Cedel depository and vice versa. In 1980 Euroclear and Cedel automated the linkage between their securities settlement systems by installing an electronic "bridge." Since the implementation of the electronic bridge, securities transactions between the Euroclear and Cedel systems have been effected by means of book-entry transfers. To facilitate the cross-system linkage, each system maintains a securities and a cash account with the other.[2] In principle, all securities eligible for deposit with both systems are eligible for bridge delivery (i.e. Euro-bonds as well as domestic securities). The bridge is thus a reciprocal linkage between the two systems.

In 1994 MGT/EOC delivered on average some US$ 8.0 billion of securities to Cedel each business day and Cedel some US$ 7.6 billion to Euroclear. Receipts from Cedel thus represented about 10% of total Euroclear turnover, while receipts from Euroclear represented about 30% of Cedel turnover.

1. The old bridge arrangement

From 1980 to mid-September 1993 the processing cycle for securities transactions over the bridge took account of the time-lag between the Cedel and Euroclear processing cycles. The former took place on the settlement date (daylight processing on day S), while the latter took place during the night before the settlement date (overnight processing starting on S-1).

Euroclear participant to Cedel participant

Chart 1 illustrates the procedure followed in the case of a delivery of securities from a Euroclear participant to a Cedel counterparty. The Euroclear participant's instruction was entered in the chaining process on the evening of the business day preceding the value date (S-1). If the participant had enough unencumbered securities in his account, his securities account was debited and his cash account credited for value S. Cedel's "transit" securities account with Euroclear was credited and its "transit" cash account debited. Before 10:00 at the latest on day S the delivery instructions from the Euroclear system were transmitted electronically to Cedel, which entered them in its settlement process starting in the early afternoon on the same day. Provided that cash or credit facilities were available, Cedel credited its participant's securities account and debited his cash account. It debited Euroclear's securities account and credited its cash account. In the afternoon Cedel advised Euroclear and its own participants of the settlements accepted and rejected. The accepted delivery - and the resulting payment - was reported by the Euroclear Operations Centre (EOC) to the Euroclear participant at 18:00 on settlement day; his instruction had already been executed. During the following overnight settlement run, the EOC reversed the entries in Cedel's transit securities and cash accounts and credited its actual securities and debited its actual cash account (for value S).

A rejected delivery led to the automatic reversal of the book entries in Euroclear's next overnight processing cycle, i.e. re-crediting of the participant's securities account and debiting of his

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1 The assistance received from Cedel and Euroclear in preparing this annex is gratefully acknowledged.

2 The Euroclear accounts in the books of Cedel are in the name of Morgan Guaranty Trust Company of New York as operator of the Euroclear system. Cedel - like any other participant in Euroclear - holds its accounts with Morgan Guaranty Trust Company of New York (not with the Euroclear Clearance System Public Limited Company, which owns the Euroclear system, or with the Euroclear Clearance System Société Coopérative).

cash account, for value S. The entries in Cedel's transit accounts were also reversed. Euroclear cancelled all refused bridge deliveries; rejected instructions were not automatically reprocessed and Euroclear participants had to re-input failed bridge delivery instructions. The risk of the Euroclear participant moving the funds out of his cash account during the settlement day was covered by Morgan Guaranty (MGT). Given that the security was still held by MGT, it served to collateralise this potential credit exposure if the participant's account was pledged.

Cedel participant to Euroclear participant

In the case of a delivery of securities from a Cedel participant to a Euroclear counterparty (illustrated in Chart 2) two possibilities existed, depending on whether the participant had the securities available in his account on the business day preceding the value date or only on the value date itself. Normally, a bridge delivery instruction in Cedel first led to a blocking of the securities in the account of the seller during the settlement process on the day preceding the value date (S-1).[2] (His cash account was not provisionally credited as in the case of Euroclear but, when eligible, the securities remained available as collateral.) If the participant did not have the securities available in his securities account, he was allowed to borrow them provided that he was an automatic borrower; in this case Cedel covered the charges.[3] Also on day S-1, Cedel transmitted settlement instructions in respect of the intended deliveries to Euroclear by 18:00. These then entered the Euroclear overnight settlement process starting on the evening of day S-1 for value S. If a bridge settlement instruction was accepted (cash or credit was available), Euroclear credited its participant's securities account and debited his cash account. Cedel's cash account was credited and its securities account debited. Euroclear reported the accepted and rejected deliveries to Cedel by 12:00 on day S. If the bridge instruction was successfully executed by the EOC, Cedel then made a final debit to its participant's securities account in the next settlement process on day S and credited his cash account. It also credited Euroclear's securities account and debited its cash account.

If the Cedel participant had the securities available in his securities account only on value date S (or could obtain them as an automatic borrower only on that day), Cedel would initiate the instruction, i.e. block the securities and notify Euroclear, on day S. The instruction then had to enter the Euroclear settlement process for value S+1. Confirmation or rejection by Euroclear and debiting of the Cedel participant's securities account also had to take place on S+1. Since in this case the Cedel participant did not receive the cash receipt for his delivery until S+1, Cedel compensated him for the partial loss of value by backvaluing the cash transaction to S.[4] (Cedel participants did not suffer penalties for the late delivery of securities.[5])

Deliveries refused by Euroclear because of a lack of funds in its participant's cash account (or lack of available cash credit facilities) led to an unblocking by Cedel of its participant's securities account. The corresponding failed settlement instructions were cancelled by Cedel - in other words, they were removed from its suspense file and had to be re-entered by the participants.

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2 About 75% of bridge deliveries by Cedel were thus "started" on S-1.

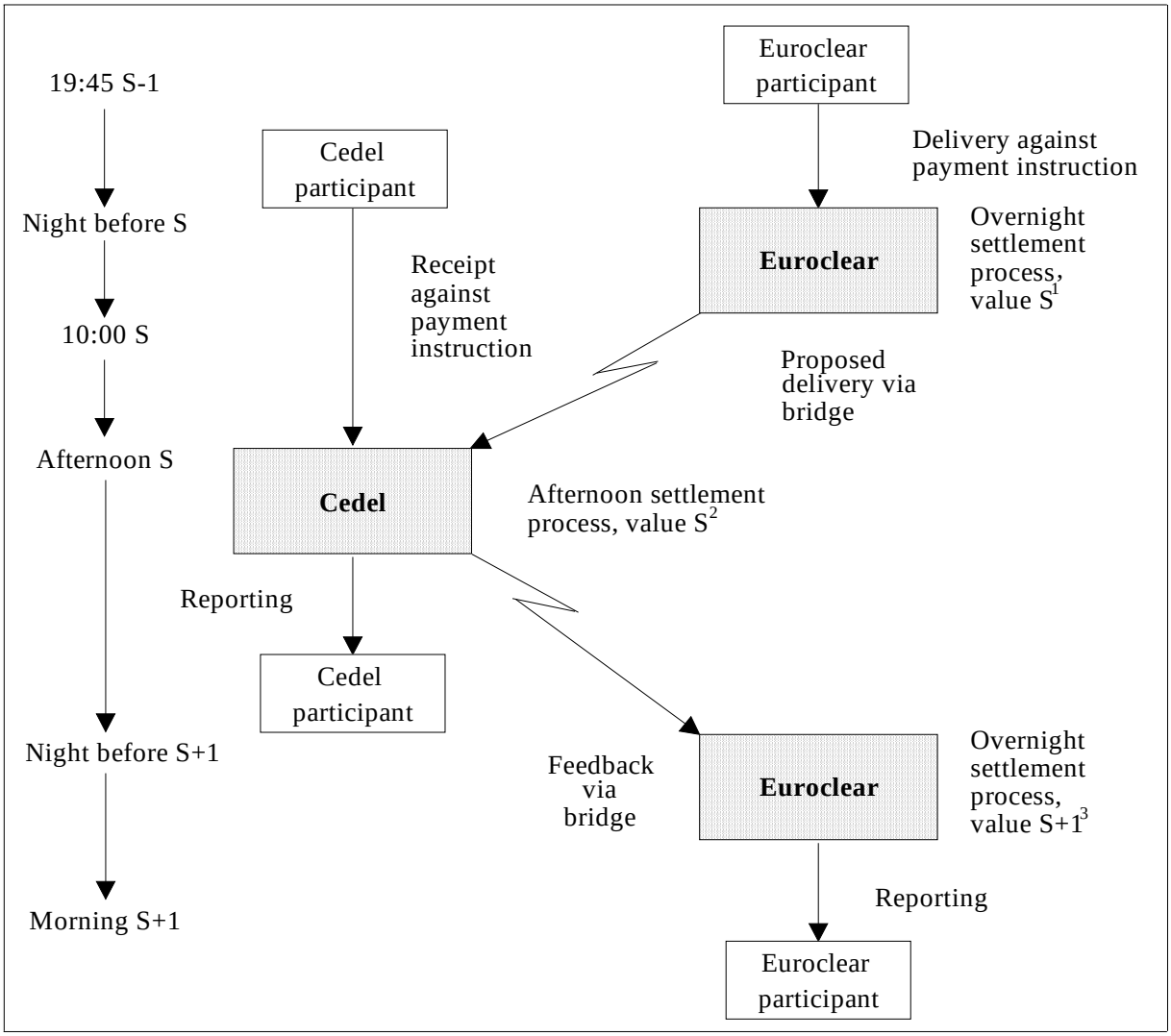
3 The participant did not need to post collateral for this borrowing; Cedel had a "lien" on the funds to be received.

4 The "subsidy" associated with backvaluing cash receipts from S+1 to S and waiving the securities borrowing charges on S-1 cost Cedel US$ 65 million in 1992.

5 According to ISMA rules, sellers of securities (payees) do not have to compensate buyers/payers in the event of late deliveries of securities as the purchasers would have been able to invest their cash holdings. Buyers/payers, however, have to compensate sellers/payees if they cannot provide the funds on the settlement date as expected, since the seller will be short of funds and may have to borrow or will forgo interest. Also under ISMA rules, the calculation of accrued interest on a contract is from the date of the last paid coupon up to the value date of the transaction, i.e. seven calendar days following the trade date.

Chart 1

Settlement procedure for a delivery of securities from a Euroclear participant to a Cedel counterparty using the old bridge



[1] The Euroclear participant's securities account is debited and his cash account credited; Cedel's "transit" securities account with Euroclear is credited and its "transit" cash account debited. [2] The Cedel participant's securities account is credited and his cash account debited; Euroclear's securities account with Cedel is debited and its cash account credited. [3] Accepted deliveries result in reversal of Cedel's transit accounts and crediting of Cedel's securities account and debiting of its cash account (value S). Refused deliveries result in reversal of all book entries for value S.

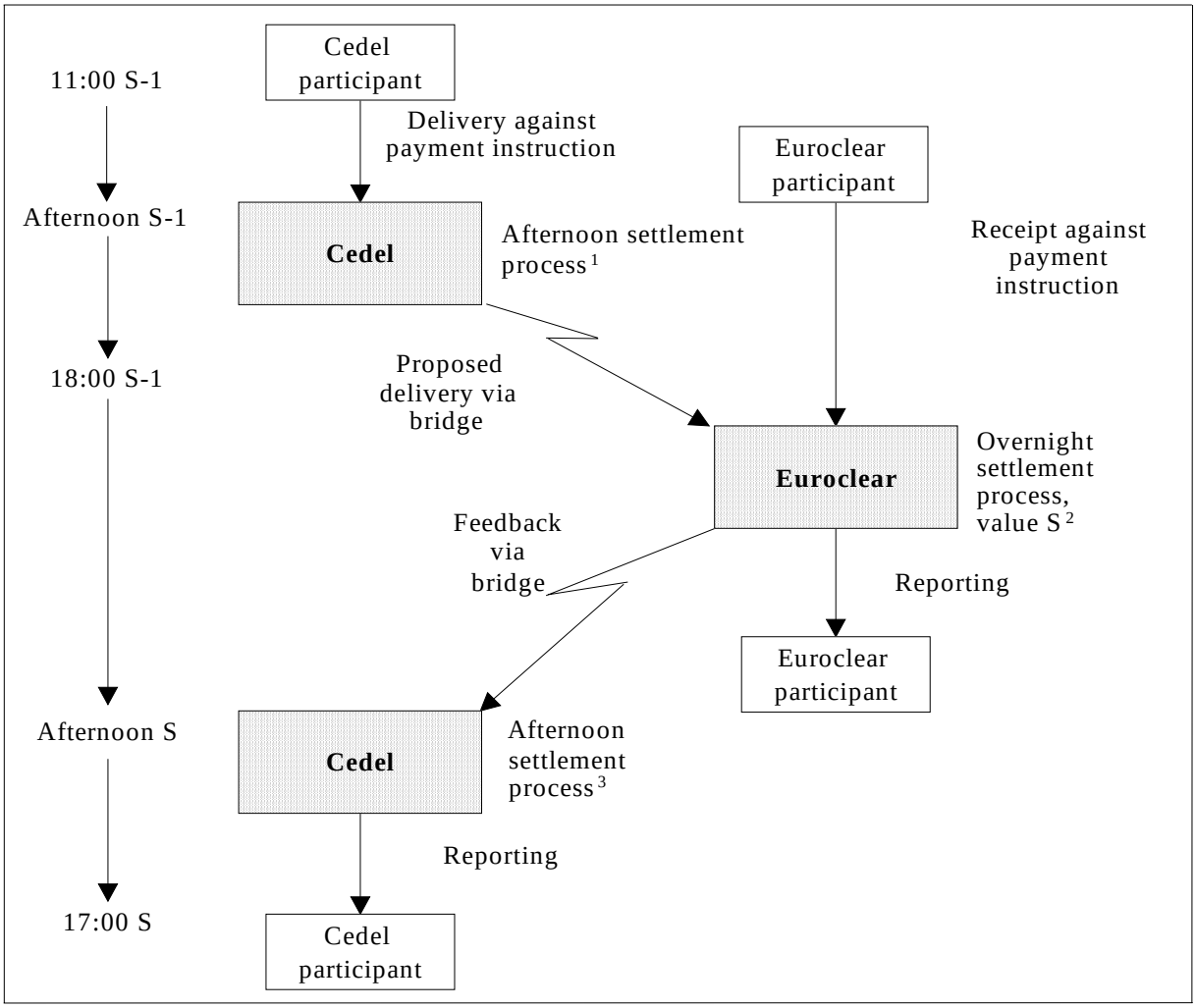
S= settlement date.

Inter-system exposures

Cedel and Euroclear maintained a cash and a securities account with one another on which the bridge settlements took place each business day. Positions on the securities accounts were effectively "offset" each day by the ordinary operation of the systems, and as a result the two systems never held a long position in the same securities with one another. However, one of the systems could sometimes find itself with a substantial custody holding for the other. In order to realign their securities accounts, the two systems could transfer securities between their depositories physically or by book entry through a domestic CSD. (In the case of domestic securities, this took place in the same city and sometimes even within the same depository if both systems happened to use the same

Chart 2

Settlement procedure for a delivery of securities from a Cedel participant to a Euroclear counterparty using the old bridge



[1] Securities are blocked in the Cedel participant's securities account. [2] The Euroclear participant's securities account is credited and his cash account debited; Cedel's securities account with Euroclear is debited and its cash account credited (value S). [3] Accepted deliveries result in debiting of participant's securities account and crediting of his cash account; Euroclear's securities account is credited and its cash account debited (value S). Refused deliveries result in cancellation of delivery instruction.

S = settlement date.

institution.) Cash positions were determined on a net basis for each currency between the two systems at 17:00 each day and settled through the systems' respective cash correspondents. Since the volume of securities movements between the two systems also resulted in substantial cash movements, each system had arranged a special cash credit line for the other. This credit facility was covered by a letter of credit which each system obtained from a separate syndicate of banks.[6]

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[6] The letter of credit covered the inter-system credit exposure determined at 17:00 (i.e. after Cedel had finished its daytime processing) until all payments had been confirmed by the systems' cash correspondents. Under the old bridge arrangement, the amount owed by Euroclear to Cedel for value S was known in the morning on settlement day, while the amount owed by Cedel to Euroclear was known only in the afternoon on settlement day, after Cedel had finished its settlement processing. For each European currency for which a transfer of funds with same-day value could be effected in

Back-to-back transactions

Under the old bridge arrangement, there were no particular problems in settling back-to-back transactions for the same settlement date if the onward delivery occurred within the same system (i.e. from a Euroclear participant to a Cedel participant to another Cedel participant or from a Cedel participant to a Euroclear participant to another Euroclear participant). The settlement of such transactions depended on the successful settlement across the bridge and on the final recipient having enough cash or unused credit facilities. It was, however, much more difficult to execute back-to-back transactions involving two bridge deliveries for the same settlement date S (i.e. from a Euroclear participant to a Cedel participant back to another Euroclear participant or the reverse). In the case of a Cedel-EOC-Cedel delivery, this was possible only if the first Cedel delivery took place on S-1 (see Chart 3); if the EOC participant had enough cash or credit available, this delivery could be accepted during the EOC's night-time processing starting on S-1; the onward delivery to Cedel could also be prepared during this processing cycle (debiting of participant's securities account, crediting of his cash account for value S; crediting of Cedel's transit securities account and debiting of its transit cash account). If the ultimate recipient (Cedel participant) had enough cash or credit available during the daylight processing on day S, Cedel could subsequently settle the last leg of the back-to-back transaction for value S.[7] In the case of an EOC-Cedel-EOC delivery, it was impossible to execute the two legs of the back-to-back transaction for the same settlement date.

If the purchase and sale legs of a back-to-back transaction could not be settled for the same value date, this resulted in a financing problem for the party in the middle of the transaction. Under the old bridge arrangement, a Euroclear participant was able to purchase from a Cedel counterparty or from another Euroclear participant and to sell onwards to another Euroclear or Cedel participant without any loss of value. But a problem was encountered in Cedel when a Cedel participant was purchasing from another Cedel participant or from a Euroclear participant to deliver onwards to a Euroclear participant, because the resale part of the back-to-back settled one day later.

Finality

It was not exactly clear when bridge settlements under the old arrangement actually became final. It could be argued that the old bridge provided DVP for the participants and the system operators since (final) deliveries were made if and only if (final) payments were made. As in the case of purely internal deliveries, principal risk was thus contained. However, the fact that the settlement lags for bridge deliveries were considerably longer than those for internal settlements caused considerable difficulties both for the participants and for the systems themselves.

As mentioned above, in the case of a Euroclear delivery to Cedel, the EOC made a final credit to its participant's cash account before receiving confirmation from Cedel that the delivery had been accepted and thus ran the risk that the participant could have wired out the funds (it did keep a "lien" on the securities since it could always reverse the crediting of Cedel's transit securities account if the delivery was not accepted by Cedel[8]). Cedel also made final book entries on Euroclear's accounts for deliveries proposed by Euroclear during its daylight processing cycle before the corresponding final book entries were made by Euroclear on Cedel's accounts. In the case of

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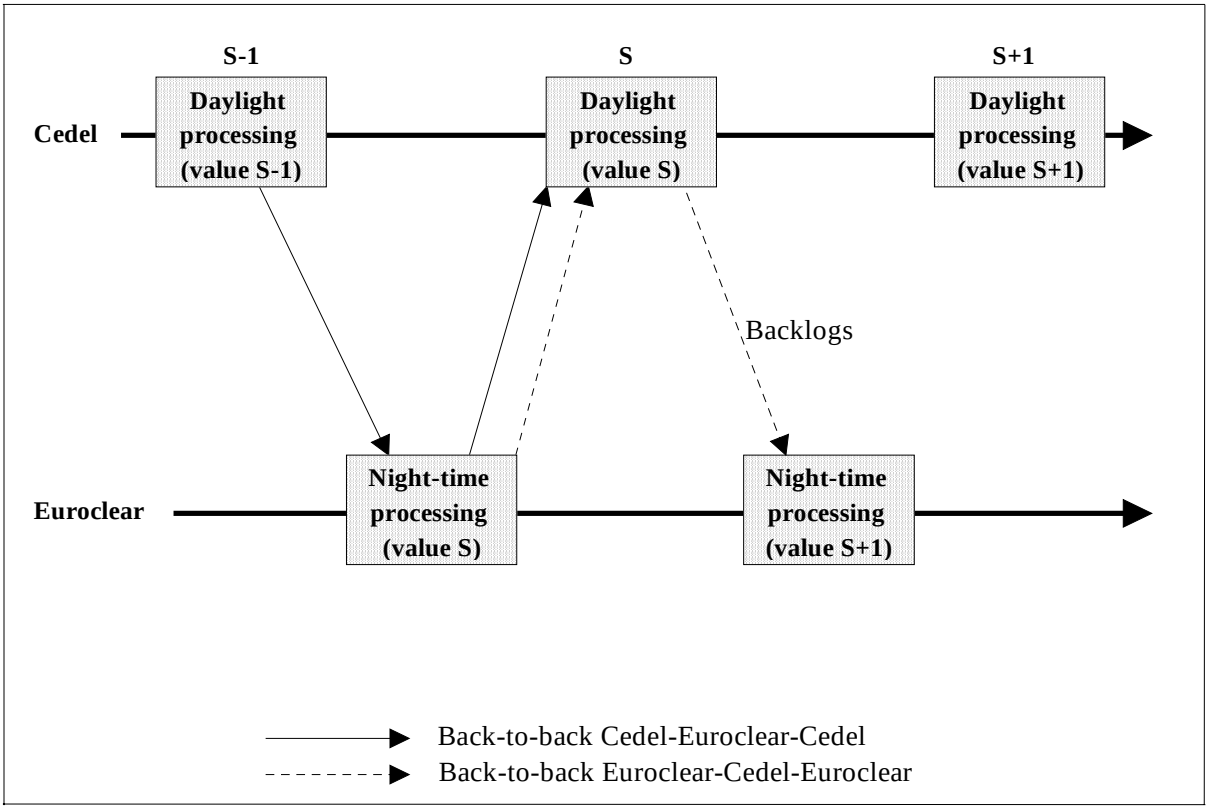
the morning and for which the transfer was carried out in the afternoon with next-day value, one day's interest was paid by the system owing the payment to the other system.

7 If the first Cedel delivery took place on S, the EOC could only process the transaction in its subsequent settlement run for value S+1 and - if the delivery could be accepted - redeliver for value S+1. The acceptance of the second delivery by Cedel could also take place only on S+1.

8 In this case Euroclear was not exposed to principal risk though it did carry the replacement cost risk of having to sell the security in the market if its participant was unwilling or unable to return the funds.

Chart 3

Back-to-back transactions under the old Bridge Agreement



deliveries from Cedel to Euroclear, Cedel blocked the securities on its participant's account either the day before settlement day or on settlement day. In the first case it covered the lending charges in case the participant had to borrow securities and in the second case it carried the cost associated with backvaluing the receipt of the funds (since Euroclear's final book entries could only be made for value S+1).

While bridge operations under the old arrangement entailed considerable risks and costs for the system operators, the participants were also exposed to liquidity risks. Admittedly, liquidity risk also arose for the participants in the systems in the case of purely internal settlements (if the securities and/or funds were not available, the deliveries simply did not take place), but there was a greater time-lag during which the bridge deliveries remained "pending". This complicated participants' cash and portfolio management.

In some respects the old bridge arrangement was less favourable for Cedel and its participants. Under the old agreement Cedel normally transmitted proposed deliveries for settlement date S to the EOC at the end of S-1 and received the EOC's file of proposed deliveries for S only in the morning of day S. Securities deliveries from a Euroclear participant or a Cedel participant processed by Cedel on day S could not, therefore, be used for further deliveries to Euroclear for same-day value. Such deliveries, called "backlogged transactions", could only be processed by the EOC during its subsequent settlement run for value S+1. This one-day delay created liquidity risk (backlogged securities were blocked on the participant's account) for Cedel participants and costs for Cedel itself (waiver of the fee for required securities lending on S-1 and the cost of backvaluing transactions).[9] This situation was described as the bridge "dependency" problem.

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9 Under the old bridge arrangement, the backlog for day S only became apparent in Cedel's settlement process for day S; such bridge deliveries for requested settlement on S were processed in the same way as bridge deliveries for settlement on S+1, except that, if accepted, the cash credits were backvalued to S when deliveries were finally settled on S+1.

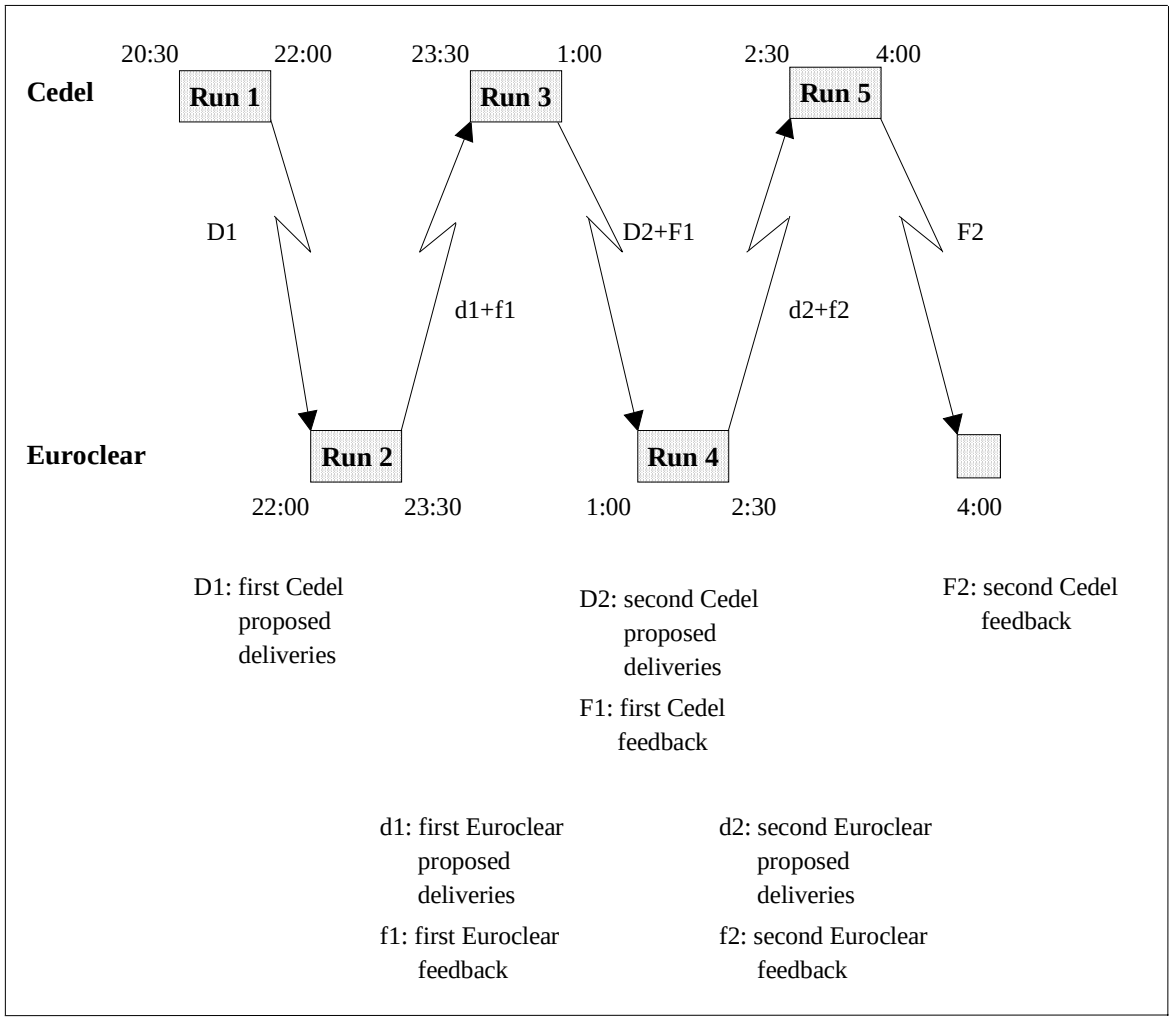
2. The new bridge arrangement

In 1990 Cedel and Euroclear agreed to renegotiate their 1980 Bridge Agreement with the aim of improving cross-system settlement efficiency. A new agreement was signed in March 1992, and the new bridge operations were successfully launched on 17th September 1993. On that day Cedel introduced a new night-time processing cycle while keeping its daytime processing cycle. (Euroclear introduced a new daytime processing cycle in December 1993. Both systems process only internal deliveries during their daytime processing cycles.) Both the EOC and Cedel now transfer files containing instructions and feedbacks over the electronic bridge several times during the night and run a number of night-time processing batches in order to release securities from one run to the next.

Running multiple settlement processings during the night before each settlement date makes it possible for each system to receive from or deliver to the other a number of times. Cedel runs three settlement batches and Euroclear two, while both systems are able to send delivery and feedback instructions twice during the night. Chart 4 illustrates the new settlement procedure. It is clear that the operations of the two systems have become much more closely interlinked.

Chart 4

Multiple overnight settlement processing under the new Bridge Agreement



Run 1: Cedel's first processing cycle

The procedure begins with a first settlement run by Cedel, which starts at the latest at 20:30 CET. Cedel's chaining programme tries to maximise internal and bridge deliveries given Cedel participants' securities and cash positions (or Cedel participants' available cash and securities borrowing facilities). If a Cedel participant has securities available for delivery to a Euroclear participant, his securities account will be provisionally debited and his cash account provisionally credited. At this stage, the system treats these funds as "unconfirmed funds" which can be used in the same settlement run (within the limits of the participant's so-called Unconfirmed Funds Facility and only if sufficient collateral is available); the securities, although already provisionally debited from the participant's account, remain available as collateral (if eligible). Euroclear's securities account is provisionally credited and its cash account provisionally debited. The proposed bridge delivery instructions are then sent to Euroclear after the first settlement batch is completed by Cedel (at the latest at 22:00).

Run 2: Euroclear's first processing cycle

After receiving the proposed deliveries from Cedel, Euroclear will start its first settlement run (run 2). Its chaining programme also tries to maximise internal and bridge deliveries, given its participants' available securities and cash positions (including credit lines). If a Euroclear participant has enough cash available to be able to accept a proposed bridge delivery from a Cedel participant, his cash account will be debited and his securities account credited. Cedel's cash account will be credited and its securities account debited. During the same settlement run, deliveries from Euroclear participants to Cedel participants are also prepared. If a Euroclear participant has enough unencumbered securities available in his account for delivery to a Cedel participant (or if he can borrow them), his securities account is provisionally debited and his cash account provisionally credited. The EOC allows its participants to "use" these funds during the same settlement run.[10] Cedel's securities account is provisionally credited and its cash account provisionally debited. At the end of its first settlement run Euroclear sends Cedel feedback messages relating to the proposed deliveries from Cedel together with its own (first) proposed deliveries (at the latest at 23:30).

Run 3: Cedel's second processing cycle

As soon as Cedel receives the feedback on accepted bridge deliveries, these become final. Upon completion of receipt of the feedback transmission, the conditionality is removed from the Cedel participant's and Euroclear's securities and cash accounts. The debit to the Cedel participant's securities account, the credit to his cash account, the credit to Euroclear's securities account and the debit to its cash account are now recorded as unconditional (since the book entries were already irrevocable, they now become final - see also Chart 5). At this moment the letter of credit[11] starts to cover the resulting inter-system exposure. (Since the cash receipt from Euroclear is now considered as confirmed, any use made by Cedel participants of the Unconfirmed Funds Facility in run 1 will no longer be conditional on collateral availability, and the securities are no longer available as collateral to the delivering participant.)

After the entries for accepted deliveries have become final, Cedel starts its second settlement run (run 3). On the basis of the new securities and cash positions of its participants, the chaining programme again tries to maximise the settlement of remaining unsettled internal and bridge deliveries ("recycling" of refused deliveries and possible "release" of additional bridge instructions). Depending on its participants' cash positions, it also makes book entries relating to the proposed deliveries from Euroclear participants. After the completion of the second settlement run, Cedel sends

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[10] As under the old bridge arrangement, the resulting risk is borne by MGT which keeps a short-term "lien" on the securities if the participant's account is pledged.

[11] The arrangement involving the letter of credit from a syndicate of banks is similar to that under the old bridge (see above).

to Euroclear a second batch of proposed bridge deliveries together with a feedback on accepted and refused bridge deliveries (at the latest at 01:00).

Runs 4 and 5

Once the feedback on proposed deliveries accepted by Cedel is received by Euroclear, the corresponding book entries are made unconditional and Euroclear starts its second settlement run (run 4). Failed instructions re-enter the chaining procedure together with the second proposed deliveries by Cedel and any other remaining internal settlement instructions. Upon completion of this second Euroclear run (at the latest at 02:30), a second feedback and proposed deliveries file is sent by Euroclear to Cedel, which then starts its third settlement run (run 5). During this last run Cedel's chaining programme attempts to settle proposed bridge deliveries from Euroclear depending on its participants' new cash and securities positions. It also prepares the settlement of any remaining bridge deliveries from its own participants to Euroclear. However, since Euroclear does not run another settlement batch during the night for same-day settlement, any new provisional book entries relating to bridge deliveries by Cedel for the same value date remain outstanding until the following night, when the related instructions can be communicated to Euroclear after the first settlement run (backlog - see below). Cedel communicates to Euroclear only the feedback on Euroclear's second proposed deliveries (at the latest at 04:00). Deliveries refused by Cedel cause Euroclear to reverse the corresponding conditional book entries it had made during run 4; these deliveries automatically re-enter Euroclear's first settlement batch during the following night. Deliveries accepted by Cedel mean that the conditional book entries made by Euroclear in its participants' and Cedel's accounts during run 4 become unconditional (Euroclear does not need to run a third batch settlement process to effect this).

Finality

The new Bridge Agreement makes it clear exactly when finality of bridge deliveries is achieved. It occurs only when the delivering system operator receives the end of the relevant feedback transmission (i.e. when a system receives confirmation from the other system - after the latter has run its subsequent settlement batch - that the proposed delivery has been accepted by it - see Chart 5). The cash and securities credits and debits entered by the two system operators remain provisional until that moment. Entries corresponding to accepted transactions then become final, whereas the provisional entries relating to refused bridge deliveries are reversed. When the book entries become final, the resulting credit exposures for the two systems (see Chart 6) are covered - as before - by a letter of credit which each system obtains from a syndicate of banks.

Improvements achieved with the new bridge

The new Bridge Agreement has a number of significant implications for Cedel and Euroclear participants and for both system operators. First, the new arrangement reduces settlement risks involved in bridge deliveries. While the new bridge continues to operate on a DVP basis (principal risk is contained), the reduction in the time-lag between proposal and acceptance of deliveries between the two systems, in the occurrence of failed transactions and in delays in settlement significantly reduces replacement cost risk and liquidity risk. This benefits both the participants and the system operators themselves. MGT, for instance, is exposed for a much shorter period to the credit risk involved in crediting its participant's cash account before knowing whether the final delivery to and corresponding final payment from Cedel will actually take place. The duration of the credit exposures that the two systems may have on one another until they receive final payments in each currency through their cash correspondents (and which are covered by letters of credit - see above) is also much shorter.

Second, the new bridge makes it possible to settle back-to-back transactions involving two bridge deliveries: theoretically, Cedel has one possibility to finish a back-to-back (Euroclear/Cedel/Euroclear - runs 2/3/4) while Euroclear has two back-to-back possibilities

Chart 5

Illustration of finality of bridge settlements under the new Bridge Agreement

(delivery from a Cedel participant to a Euroclear participant)

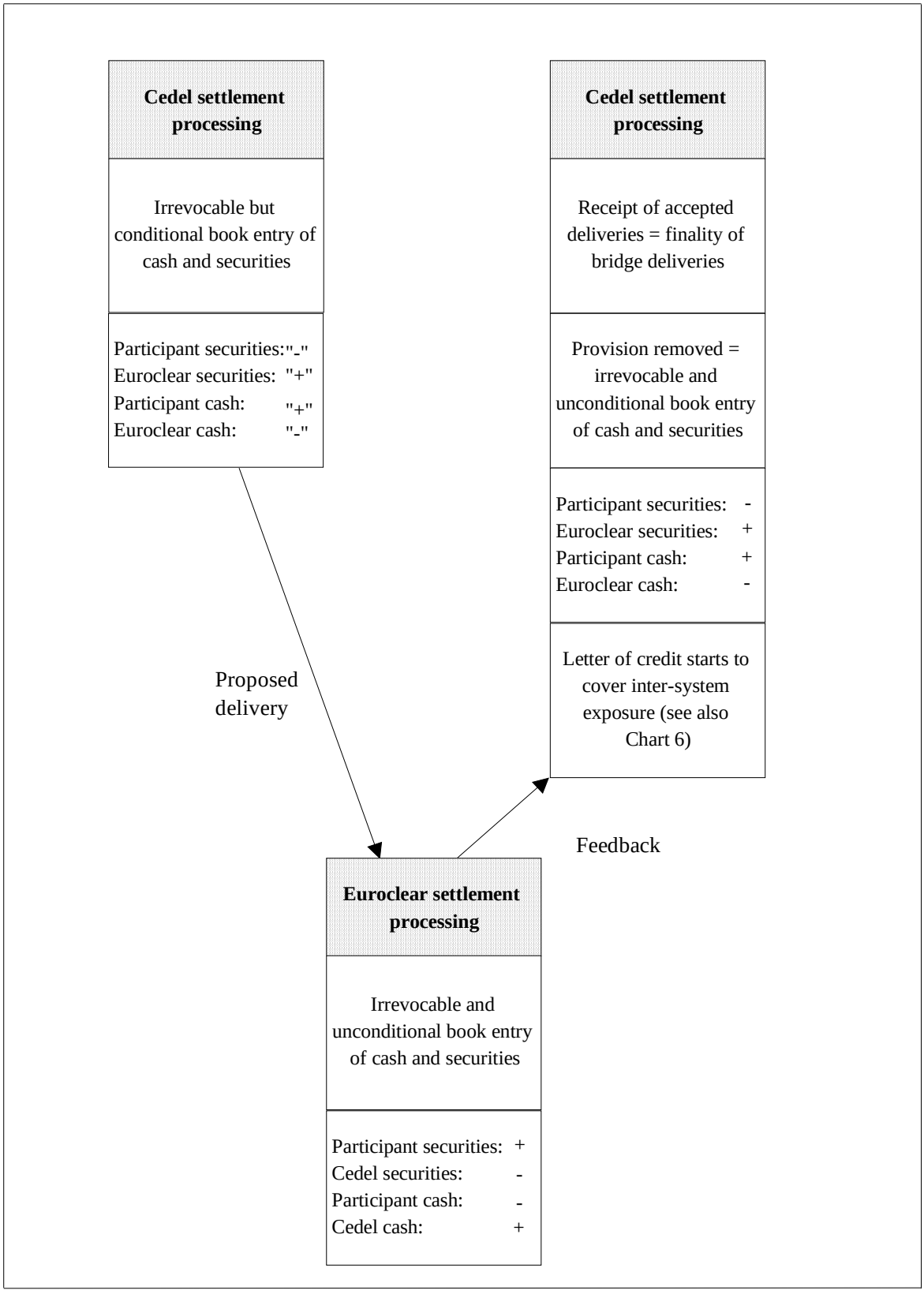
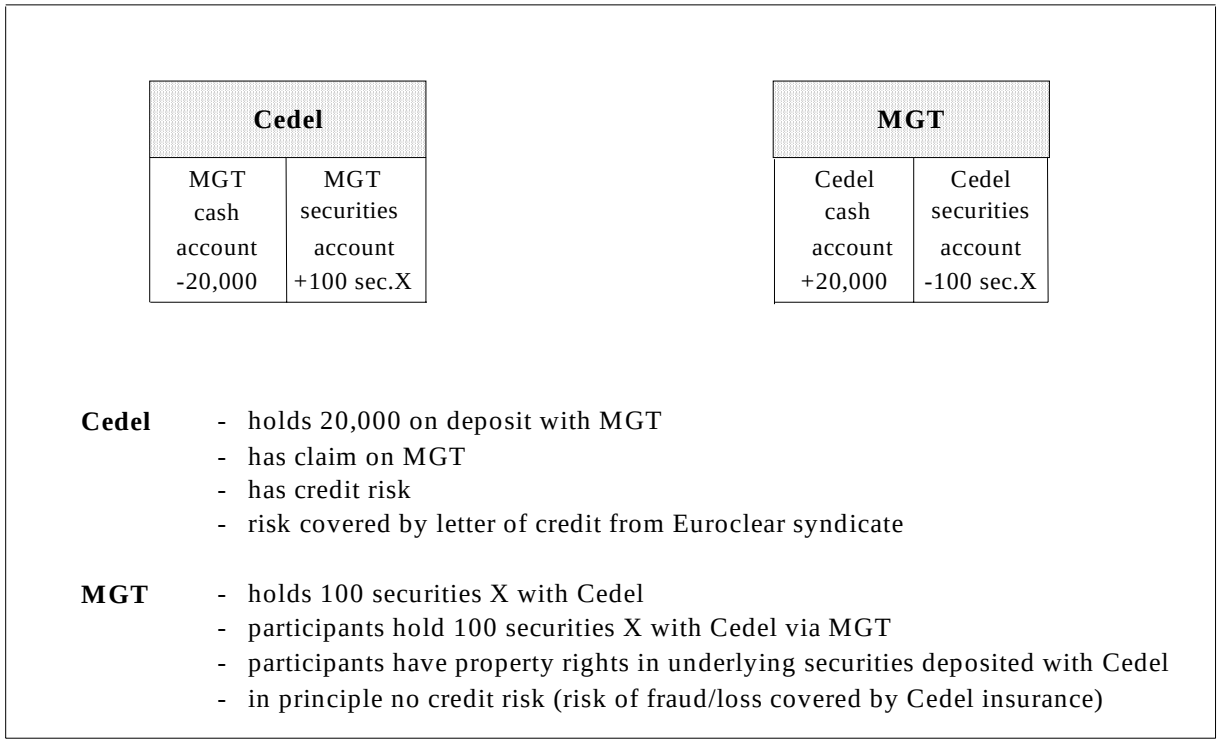


Chart 6

Example of inter-system credit exposure

(delivery from a Cedel participant to a Euroclear participant)



(Cedel/Euroclear/Cedel - runs 1/2/3 and 3/4/5). Third, participants now receive reports early in the morning on settlement day rather than in the evening, while Euroclear already sends out reports to its participants during the night (information about cash and securities transactions is made available upon completion of its first settlement run). Participants' cash management is therefore improved (for Cedel participants same-day wire transfer will become available in eight currencies). Fourth, both systems now have similar deadlines for the submission of securities transfer instructions by their participants. Cedel participants have to enter their instructions by 19:45 on S-1 (this was already the deadline for Euroclear participants). Fifth, improved settlement efficiency should reduce the need for both systems' participants to rely on securities borrowing facilities. While bond lending facilities are available during each system's individual settlement runs (depending, of course, on the available lending pool and collateral), participants are not charged for the securities borrowed in one settlement run if these can be reimbursed in a subsequent settlement run during the same night (when the participant receives securities of the same kind during that settlement process). The charges for securities borrowing are effectively calculated from the positions at the end of the overnight settlement runs. Sixth, both systems now automatically recycle unsettled bridge instructions so that participants no longer have to re-enter these themselves.[12] This significantly reduces errors and late deliveries/payments. Finally, the costs for Cedel associated with the operation of the old bridge (charges for securities borrowing and backvaluing of payments) have been eliminated.

[12] The EOC will recycle refused deliveries until the fourth business day after the settlement date. After that the instruction will automatically be cancelled at the end of that day's securities settlement process. Cedel will also not cancel failed bridge delivery instructions as long as they are matched. If such instructions are or become unmatched, they will be treated in the same way as other unmatched instructions: they will remain pending for forty days and will then be cancelled unless the participant requests an extension, which may not exceed fifteen days.

Remaining backlogged deliveries

Some deliveries from Cedel to Euroclear can still be backlogged, though their total value is expected to be significantly reduced. Backlogs can continue to occur for Cedel participants if they receive during the final overnight settlement batch enough securities in their account to allow them to make bridge deliveries for the first time.[13] Such backlogs differ from other transactions which have been presented to Euroclear but have been refused and are recycled during Cedel's third run;[14] in this case, the responsibility for the failed settlement lies with the purchaser who could not provide Euroclear with the necessary cash (or could not borrow from Euroclear) to allow it to execute the bridge transaction.[15] Since there is no further transmission to the EOC for that settlement date, the backlogged instruction has to remain pending until the following overnight processing.[16] In this situation the Cedel participant's securities account remains provisionally debited until confirmation is received from Euroclear regarding the acceptance or refusal of the transaction. Since the provisional book entries are irrevocable, backlogs cannot be cancelled by the Cedel participant,[17] though the collateral value of the securities which have been provisionally debited from his account is maintained. The backlogged delivery instructions have priority in Cedel's first transmission of proposed deliveries the following night. If accepted they will settle in the overnight processing for day S+1. However, Cedel will no longer backvalue the cash credits. (Backlogs do not arise for Euroclear in its daylight processing cycle since it does not process bridge deliveries during the day.)

Contingency procedures

The time schedules for the different settlement runs by each system as well as for the exchange of files containing proposed deliveries and/or feedbacks have been contractually agreed and are thus relatively strict. Given that the two systems have become much more reliant on one another to successfully complete their overnight settlement batches, a number of contingency procedures have been worked out.

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13 Transmissions of proposed deliveries and feedbacks only occur during overnight processing. Strictly speaking, a backlog, as defined above and as minimised by the new Bridge Agreement, is only created in overnight processing. However, other bridge deliveries, which are not backlogs in the strict sense defined above, are nevertheless processed in the same way in Cedel's daytime processing and are reported to participants as backlogged: these are bridge deliveries which were not backlogged in overnight processing but for which Cedel's participant is in a position to deliver during daytime processing.

14 If a bridge delivery proposed by Cedel is rejected by the EOC during its second settlement run, this rejection for value S will be reported by Cedel to its participant. The delivery will be recycled in Cedel's third settlement run, and may also be "backlogged" at the end of Cedel's overnight processing, so as to give this delivery instruction priority during the next overnight processing.

15 In this case the Euroclear participant will have to compensate the Cedel participant for the late payment.

16 Under the new bridge arrangement, the backlog is apparent at the end of Cedel's last overnight processing run for day S, since the securities which cause the backlog are received by Cedel in Euroclear's last proposed deliveries transmission. The backlogged deliveries fulfil all the conditions to settle on S but cannot be proposed by Cedel to Euroclear until the next overnight processing.

17 Backlogs do not arise in the case of Euroclear. Euroclear would, in principle, be able to input additional deliveries to Cedel participants during its second run as a result of incoming deliveries over its other links. The Bridge Agreement, however, stipulates that Euroclear will apply reasonable best efforts to exclude such input from its second delivery to prevent an extra source of backlogs. Both systems have also agreed to deliver as much as possible as early as possible to increase bridge settlement efficiency and reduce backlogs.

Future enhancements

The new Bridge Agreement has been built on an “evolving bridge” principle. This means that Euroclear and Cedel are committed to regularly reviewing the operation of the bridge procedures and to attempting to improve it when possible. The general aim is to provide participants of both systems with improved performance in terms of later cut-off deadlines and earlier reporting. The systems have agreed to two additional processings nine to twelve months after the new bridge has stabilised, i.e. after the operation of the new bridge has met certain specified technical criteria. This will imply that Cedel will ultimately run four settlement batches and the EOC three and that both systems will be able to make three deliveries and three feedbacks per night. It is expected that this would completely eliminate any backlog. In this new environment Cedel would in principle have the opportunity to complete two back-to-back runs and Euroclear three.

ANNEX 5

THE LINK BETWEEN EUROCLEAR AND THE DEUTSCHER KASSENVEREIN (DKV)[1]

This annex describes the link between one of the international CSDs, Euroclear, and the German domestic CSD, the DKV.[2] The link is used to effect cross-border settlements of trades in German securities. In 1994 on average the equivalent of US$ 15.6 billion of transactions were settled across this link each business day. By comparison, total daily turnover in Deutsche Mark securities during 1994 averaged the equivalent of US$ 23.5 and 36.4 billion at the DKV and Euroclear respectively.[3]

The annex is divided into three sections. First, the general structure of securities settlement in Germany is described. Then, the DKV's links to foreign CSDs and ICSDs are discussed, including its links via the Deutscher Auslandskassenverein (AKV). The last section describes the DKV/AKV-Euroclear link in detail.

General structure of securities settlement in Germany

The general institutional arrangements for securities custody in Germany are described first. This is followed by a description of the securities settlement arrangements of the Deutscher Kassenverein, the CSD for all German securities.

Institutional arrangements. In Germany most securities transfers are made by book entry. The German CSD is the Deutscher Kassenverein AG (DKV). The DKV is owned by Deutsche Börse AG (the German Stock Exchange), which is itself owned by the German banking industry. It is the central custodian for securities held in giro-transferable collective custody and the central agency for the securities transfer system. Within Germany, the DKV is considered a specialised bank with a limited range of business and is subject to official supervision by the Federal Banking Supervisory Office. The Deutsche Bundesbank has provided the DKV with a funds account.[4]

The DKV has branches in the following cities with stock exchanges: Berlin, Düsseldorf, Frankfurt (the main branch), Hamburg, Hanover, Munich and Stuttgart. Only credit institutions that are subject to the statutory audit of deposited securities or comparable audits and securities trading firms that meet special requirements may become account holders. Practically all banks active in the business of securities trading and custody in Germany hold accounts with the DKV.[5] 98% of the bonds and about 70% of the shares issued in Germany are held in custody by the DKV.

Settlement procedures. Securities transfers against payment are recorded by the DKV only on a delivery versus payment basis. Although in operational terms the book entries for securities transfers are made in advance, they become legally effective when the securities account statements have been delivered to the DKV's participants. This will not happen before the corresponding cash transfers are final. Cash payments are settled in Deutsche Mark via the DKV branch accounts and the

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1 The assistance received from Euroclear and the Deutscher Kassenverein in preparing this annex is gratefully acknowledged.

2 The other international CSD, Cedel, has a link to the DKV that is similar to the link discussed here.

3 The deliveries across the link are counted both ways, that is, both those from DKV/AKV to Euroclear and those from Euroclear to DKV/AKV are included. The internal turnover figures of DKV and Euroclear relate only to deliveries (no double-counting). The figures are therefore not strictly comparable.

4 The technical platform for the DKV's operations is provided by the Deutsche Wertpapier-Datenzentrale GmbH (DWZ), a specialised computer company owned by the German Stock Exchange.

5 At the end of 1993 the DKV had 563 direct participants.

DKV participants' accounts held with the Bundesbank's branches.[6] Payment is final at about 13:00 on settlement day.[7]

In terms of the models identified in the DVP Report, settlement arrangements at the DKV resemble a model 3 type. Securities transfer instructions are processed transaction by transaction during two batch cycles.[7] The batch programmes attempt to maximise the number of settlement instructions that can be carried out on the basis of available securities in participants' accounts through iterations. Account is taken of priorities which participants may give to their instructions, of the settlement date (older outstanding instructions are processed first) and of the size of the trades (large transfers are settled before small ones). For each against-payment securities transfer instruction executed during the batch processing cycles the corresponding cash clearing accounts of the payer and payee are debited and credited. At the end of the batch cycle each participant thus ends up with a single net cash position since all his incoming and outgoing payments are effectively offset.

The first of the two securities batch processing cycles (see Chart 1) takes place on the evening before settlement date (S-1) and is called the standard processing cycle. The second occurs in the morning on the settlement date (S) and is referred to as the same-day processing cycle.[8] For the standard processing cycle, which typically takes place between 17:30 and 20:30, instructions have to be entered by 17:00 on S-1 at the latest. In the case of the same-day processing cycle, which is carried out between 10:00 and 10:30, the cut-off time for submitting instructions is 10:00 on S.[9] At the end of each processing, that is, around 20:30 and 10:30 respectively, the DKV makes available to the participants a statement of executed and unexecuted trades (so-called "Regulierungsliste" or delivery list) as well as the resulting net cash position (debit or credit). The Securities Deposit Law in Germany does not allow a central securities depository to grant credit facilities in the form of securities. If securities are not available on participants' accounts, the delivery instructions will remain unexecuted. Unexecuted instructions are automatically carried over to the next processing run (i.e. either the next standard or same-day processing).

Participants with a net debit cash position at the end of the same-day processing cycle must have the necessary cover available on their Bundesbank account by 12:00. The cover may consist of reserve balances or available overdraft facilities.[10] Upon instruction from the DKV the Bundesbank - through its various branches - will debit the accounts of all participants in a net debit position at around 13:00. When all debit positions have been covered, the Bundesbank pays out the corresponding amount to the participants with a net credit position. At that time the provisional

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6 The DKV also executes transactions in ECUs which can also be settled across the AKV-Euroclear link. The procedures relating to these settlements are not covered here.

7 The times indicated refer to CET.

7 The DKV is currently developing a real-time settlement arrangement, which could be made available in the first quarter of 1995. However, it is not intended to replace the current batch processings with the new facility but rather to operate the real-time service together with the current batch processings. It is not yet clear how the new facility will affect the inward links of the DKV.

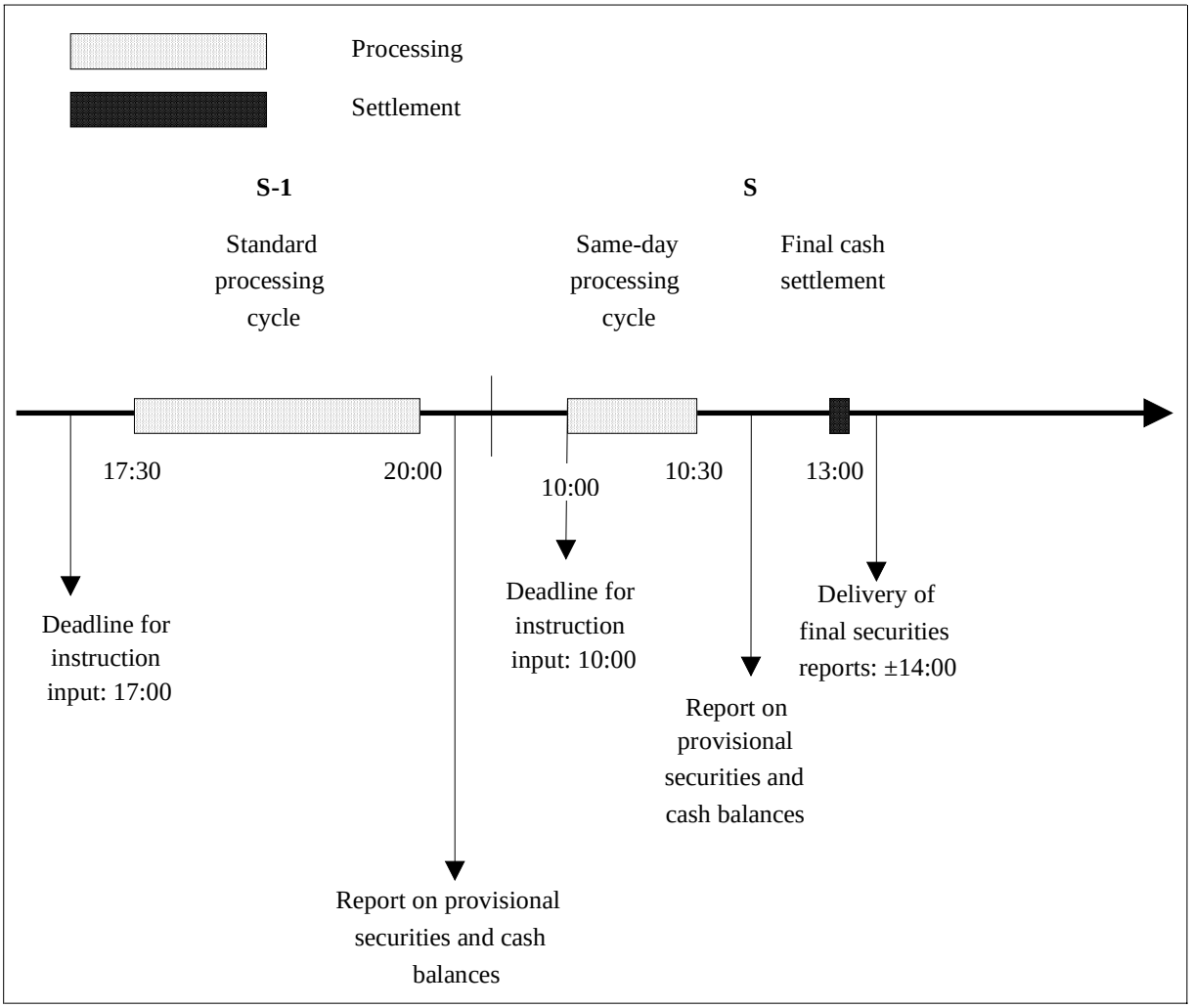
8 The processing cycles are sometimes mistakenly called settlement cycles. In fact, final settlement of these processing cycles takes place only after all payments have been made by around 13:00 on the settlement date.

9 These deadlines refer to instructions submitted by on-line telecommunication. There are earlier cut-off times for the input of instructions by mail or data teleprocessing. Matched delivery instructions become irrevocable after the input deadlines.

10 Banks may overdraw their giro account at the Bundesbank in the course of the day up to the value of the securities which they have lodged with it (lombard giro overdraft). Any outstanding debit position at the end of the day results in an overnight borrowing from the Bundesbank under its lombard facility (the lombard rate is normally above the overnight interbank lending rate).

Chart 1

The DKV securities settlement system



securities transfers executed during the batch processing cycles also become final. Should one of the participants in a debit position be unable to provide the required cover, the clearing for that day would have to be unwound and a new clearing put in place without the failed participant.[11]

The DKV provides a securities lending and borrowing programme to its participants. There is, however, no automatic borrowing facility as part of the securities processing cycle.[12] Participants must submit their individual borrowing requests to the DKV prior to the processing cycle, and the DKV will arrange for the securities involved to be made available from a lending pool. The execution of the borrowings will result in a free-of-payment transfer during the batch processing runs. The securities lending transactions are guaranteed by an underwriting syndicate of banks. The DKV, however, operates the guarantee scheme, for instance, by taking collateral from the borrower. It must be noted that the DKV programme is only part of the market for securities lending in Germany, where many transactions are arranged directly and bilaterally between the lender and the borrower.

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11 The DKV has never been obliged to rely on the unwind mechanism.

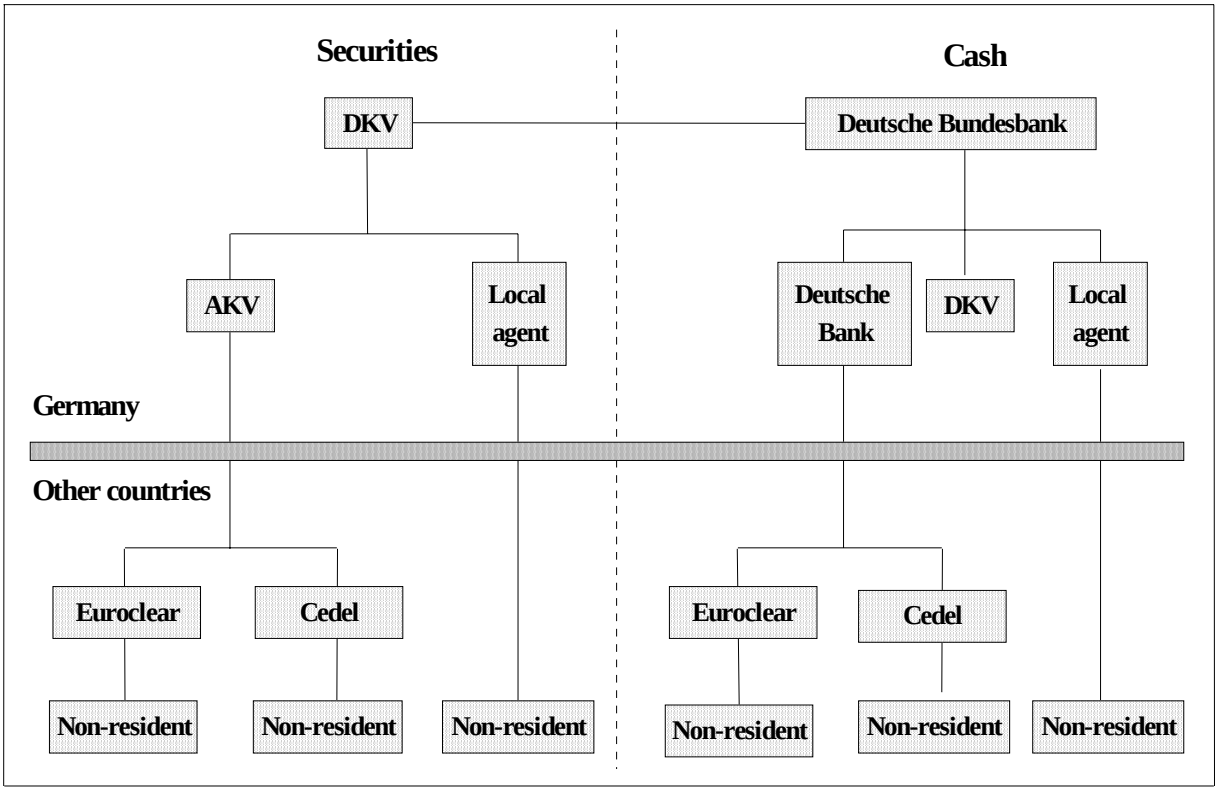
12 The general need for securities borrowing to avoid settlement fails is reduced to some extent by the fact that deliveries are not constrained by the buyer having insufficient funds in his running cash clearing account during the processing cycles.

Cross-border securities settlement arrangements

The DKV has developed various inward and outward links for securities settlements. These are described below.

Chart 2

Securities settlements in Germany



Direct DKV links with foreign depositories. Until recently the DKV was not allowed to provide securities custody to non-residents directly, with the exception of foreign CSDs that offer the same kind of legal protection in terms of securities custody for their account holders and only for securities that are admitted for trading on an official stock exchange, a regulated unofficial market or a comparable regulated market in both countries. Such arrangements cover custody and settlement facilities, for instance, for the shares of Deutsche Bank AG and Swiss Bank Corporation traded both in Germany and in Switzerland.

Reciprocal account relationships of this kind are currently available between the DKV and Necigef in Amsterdam, the Oesterreichische Kontrollbank (OEKB) in Vienna, SICOVAM in Paris and SEGA in Zurich.[13]

All these institutions are third-party depositories for securities that have been lodged with the DKV and can therefore be delivered in Germany. Conversely, the DKV may hold German and foreign securities that meet the above-mentioned requirements on behalf of foreign central depositories. Of these links, only the links with Necigef, the OEKB, and SEGA permit transfers

[13] The DKV also has a link with the DTC in New York that permits settlement of trades in US securities on stock exchanges in Germany. However, this link is not reciprocal, that is, it cannot be used by DTC participants to settle trades in German securities.

against payment between a participant in the DKV and a participant in the other CSD. The link to SICOVAM allows only free-of-payment transfers.

Links via the Deutscher Auslandskassenverein AG (AKV). In order to facilitate cross-border securities transactions, the Deutsche Auslandskassenverein (German Foreign Securities Depository), or AKV, was established for institutions and securities that do not meet the above-mentioned legal requirements. The AKV is a member of the settlement system of the DKV (see also Chart 2).

Foreign CSDs can hold German securities in custody with the DKV via the AKV and thereby take part in the German securities transfer system. These inward links to the DKV enable German banks to make deliveries of German securities to non-residents through their securities accounts with the DKV, or to receive deliveries through the DKV from non-residents. Such links currently exist with Cedel in Luxembourg, the CIK in Brussels, Euroclear in Brussels, the JSCC in Tokyo, Monte Titoli in Milan, and the OEKB in Vienna. Delivery against payment arrangements are available only with Cedel, Euroclear and the OEKB.

German banks can also have their foreign securities which are ineligible for safekeeping with the DKV held in custody abroad - on a fiduciary basis[14] - via outward links of the AKV. The AKV holds securities accounts for this purpose with collective securities deposit banks in twenty-four different countries. Cedel, for instance, is the AKV's depository for the Euro-bonds which the German banks decide to deposit with it. Transactions in foreign securities between AKV account holders are effected without the involvement of the foreign depositories. Securities are transferred by means of book entries on the AKV's internal securities accounts with simultaneous cash settlement - also in foreign currencies.[15]

The link between DKV/AKV and Euroclear (EOC)

Morgan Guaranty Brussels, as operator of the Euroclear system, is a direct member of the AKV (see also Chart 2). Thereby participants of the Euroclear system can receive securities from, and deliver securities to, all members of the DKV system by book entry. In practical terms Euroclear has a direct operational link with the DKV for the input of instructions and the receipt of information. Euroclear/Morgan Guaranty Brussels holds an omnibus securities account with the AKV. Since Euroclear/Morgan Guaranty Brussels does not have a deposit account with the Deutsche Bundesbank, Deutsche Bank AG acts on behalf of Euroclear (and its participants) to cover the cash leg of Euroclear's transactions in the DKV settlement. All debits and credits to Euroclear's securities accounts thus result in a corresponding credit and debit in Deutsche Bank's running cash clearing account. Deutsche Bank thus settles the cash leg of all transactions effected over the AKV-EOC link on behalf of Euroclear at 13:00.[16]

Before 1993 DKV/AKV and Euroclear both ran only one processing cycle per settlement day, on the evening before and during the night before settlement day respectively. Therefore, DKV and Euroclear participants had to give delivery instructions to the DKV and Euroclear one day and two days before settlement day respectively. Back-to-back transactions were only possible within the local (overnight) batch processes on each side of the link between participants in the same batch process. In 1993 the DKV introduced its same-day processing cycle and Euroclear started to run an

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14 In contrast to the safekeeping of securities abroad by the DKV, this "fungible deposited securities account" is based only on a contractual delivery claim. The legal owner or co-owner of the securities is the AKV. Given the fiduciary structure of this type of custody, securities depositors are, however, also fully protected against losses in this system.

15 The AKV uses the foreign depositories as cash correspondents for foreign currencies.

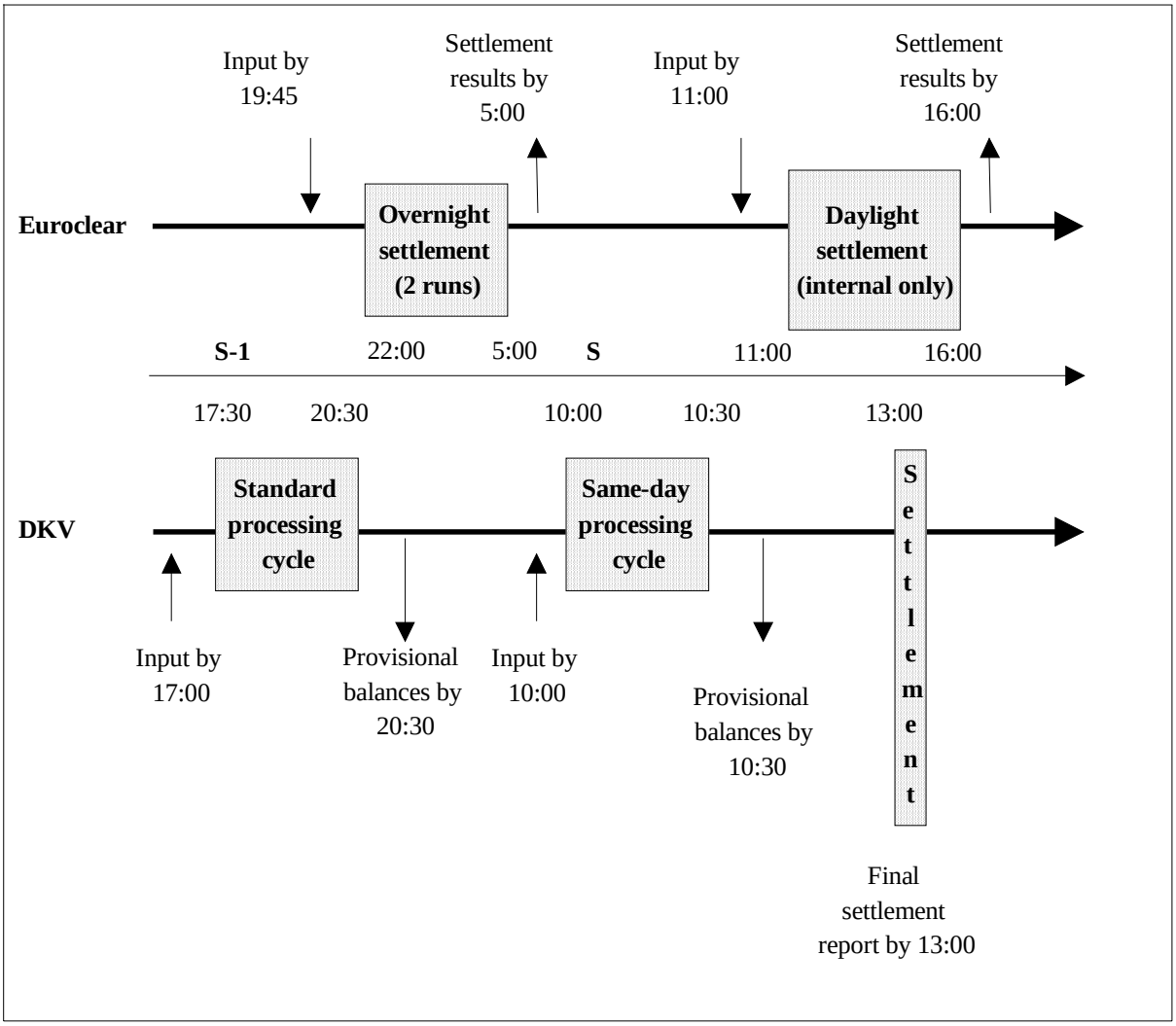
16 It should be pointed out that exactly the same arrangements exist between DKV/AKV and Cedel. In fact, Deutsche Bank also acts on behalf of Cedel for the settlement of Cedel's cash position with the DKV. It is also Cedel's cash correspondent for Deutsche Mark.

additional daylight processing cycle (see also Chart 3). As explained below, this permitted the settlement of back-to-back transactions, including those involving a same-day turnaround across the link.

The following describes in detail the current settlement procedures across the link. No specific reference is made to the matching of participants' instructions, which takes place on an almost continuous basis between the two systems. The systems regularly communicate to one another information on participants' instructions for settlement across the link and corresponding matching reports. All against-payment instructions have to be matched before they are allowed to be input for settlement.

Chart 3

The Euroclear and DKV processing cycles for value S



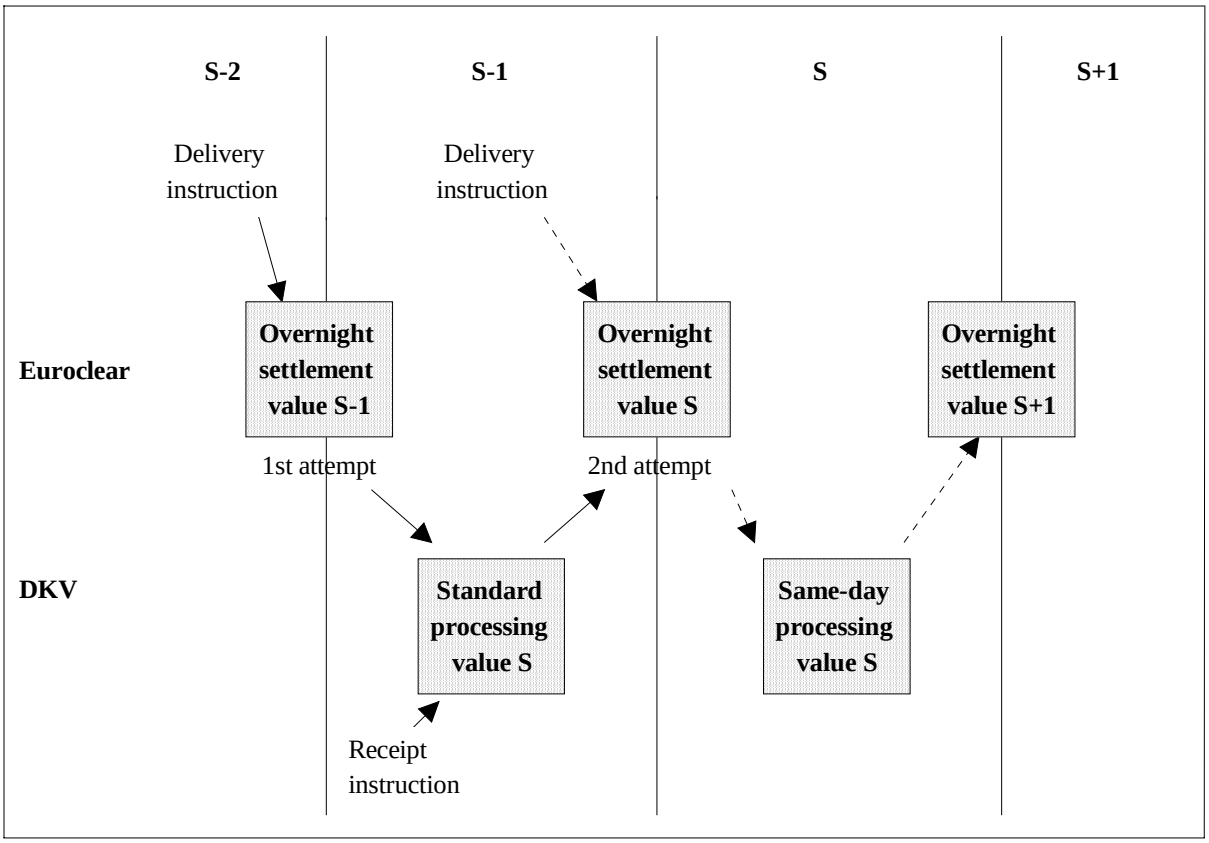
Delivery from a Euroclear participant to a DKV participant. Chart 4 illustrates the procedures followed in the case of a delivery of German securities from a Euroclear participant to a DKV participant. Euroclear can make two attempts to execute the delivery, depending on whether the participant has submitted his instruction before the settlement process for value S-1 (that is, on the evening of S-2) or that for value S (that is, on the evening of S-1).

In the case of the first attempt, the EOC will provisionally debit the securities on the participant's securities account in the settlement process for value S-1. However, the participant

retains the value of the securities as collateral. It will then forward the delivery instruction to the DKV, which will include it in its standard processing cycle for value S. The DKV participant's securities account is credited and his running cash clearing account is debited. Deutsche Bank's running cash account is credited and the EOC's securities account is debited. The securities become available to the DKV participant for further delivery for value S to another DKV participant (during the ongoing standard processing or the subsequent same-day processing) or back to a Euroclear participant (if the required conditions are met, as discussed below).

Chart 4

Delivery from a Euroclear participant to a DKV participant



After its standard processing is terminated, the DKV informs the EOC of the "provisional" execution of the delivery instruction in the evening of S-1, upon which the EOC makes a debit in its participant's securities account and a credit in his cash account in its overnight settlement processing for value S.[17] Deutsche Bank will credit the EOC's cash correspondent account - on a net basis for all deliveries and receipts across the link - after it receives the funds from the DKV on its Bundesbank account at around 13:00.

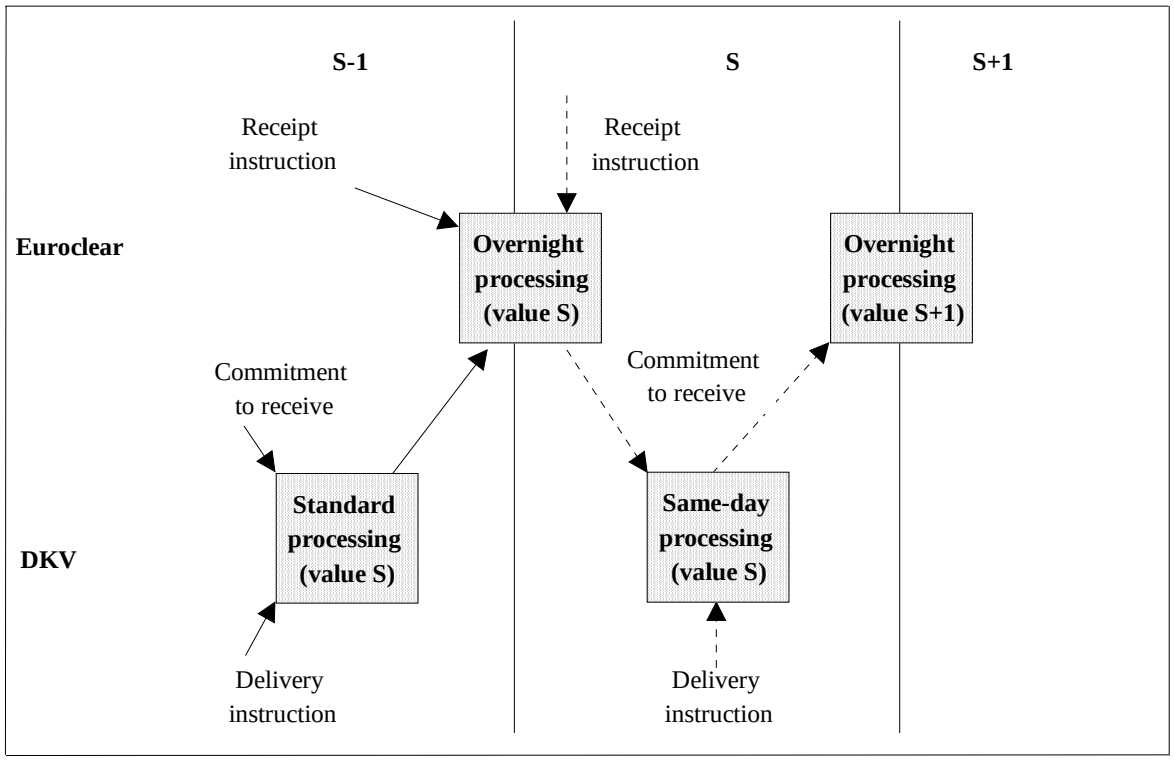
The sequence of debiting and crediting cash and securities accounts (provisionally or finally) is similar in the case of the second attempt, which the EOC will start during its settlement process for value S. The DKV "responds" to the link deliveries during its same-day processing cycle. However, since the EOC processes only internal settlement instructions during its daylight processing cycle, it can make the final debit to its participant's securities account and the final credit to his cash account only during its settlement process for value S+1. It will backvalue the entries for value S and can do this without incurring any costs since the payment from the DKV participant will have been

[17] The EOC does not make a final debit of securities and a final credit of cash, since these debits and credits could be subject to a reversal if there were an unwind in the DKV.

included in the DKV cash settlement at 13:00 on S. In other words, Deutsche Bank will have received the funds by 13:00 on S and passed on the funds to the EOC. Under the second attempt, there is no same-day turnaround possibility for DKV members.

Chart 5

Delivery from a DKV participant to a Euroclear participant



Delivery from a DKV/AKV participant to a Euroclear participant. The delivery of German securities from a DKV participant to an EOC participant is shown in Chart 5. Before the delivery instruction can be executed, the DKV needs to receive from Euroclear/Morgan Guaranty Brussels a so-called “commitment to receive”, which also amounts to an EOC commitment to pay for the securities. The reason is that the EOC acts on behalf of its participants in the DKV clearing; legally it is EOC/Morgan Guaranty Brussels and not its participant which must instruct the DKV to receive and pay for securities from a DKV participant. Moreover, the EOC needs to indicate to the DKV which matched receipt instructions for a particular settlement date it is willing to have executed since it does not (deliver and) receive through its omnibus account on a “net” basis for all its participants and all instructions. Of course, Euroclear itself will make a commitment to receive and pay only on condition that its participant has positioned the required cash amount or has sufficient credit.

Having received the commitment to receive and depending on the time by which it receives the delivery instruction from its participant, the DKV will start the delivery via the link either in its standard or in its same-day processing cycle. If the delivery and receipt instructions are received by the DKV by 17:00 on S-1, it will, during the standard processing for value S, debit its participant's running securities account, credit the EOC's running securities account, credit its participant's running cash account and debit Deutsche Bank's running cash account. It will communicate the executed (provisional) deliveries to the EOC in the evening, which will allow the EOC to process the instruction during its overnight settlement process for value S: the EOC will make a final credit in its participant's securities account and a final debit to his cash account. The securities thus become available to the EOC participant for further delivery for value S during the night-time settlement cycle

to another Euroclear participant, to a Cedel participant (across the bridge) or back to a DKV participant (same-day turnaround).[18]

If the DKV receives the delivery instruction from its participant or the EOC's commitment to receive after 17:00 on S-1 but before 10:00 on S, it starts the processing of the delivery across the link during its same-day processing cycle for value S. It debits its participant's running securities account, credits the EOC's running securities account, credits its participant's running cash account and debits Deutsche Bank's running cash account for value S. The EOC, however, will process the executed deliveries (which become final around 13:00 on S) only in its subsequent overnight settlement process for value S+1. It will then credit its participant's securities account for value S+1 and debit his cash account for value S.

Regardless of whether the link delivery was first processed by the DKV in its standard or same-day processing cycle, the EOC's securities account with DKV/AKV will be credited for value S and Deutsche Bank will pay for the transaction by 13:00 on S. Euroclear's correspondent cash account with Deutsche Bank will be debited for its net debit cash position in the DKV in the early afternoon on S.

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[18] Since the finality of the DKV settlement occurs only at around 13:00 on S, Euroclear takes a credit exposure on its participant when it allows him to on-deliver the security which it has provisionally obtained from the German domestic market. The Euroclear user guide warns that "failure of the cash clearing may result in the reversal of certain transactions or, in exceptional circumstances, the re-running of the DKV settlement cycles". If the credit of the securities to the participant's account received from the DKV standard cycle needs to be reversed owing to an unwind, the EOC would not reverse the onward deliveries that its participant settled in the overnight processing, but only the receipts of securities from the failing German counterparty. In the event that this reversal creates a negative securities position in the participant's account, the Euroclear participant would have to cover this short position within a few days. In the unlikely event that the participant was also bankrupt, or was unable to purchase the securities in the market, the ultimate risk created by this unwind would be covered by sharing the loss between all Euroclear participants with a position in the security concerned.

ANNEX 6

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